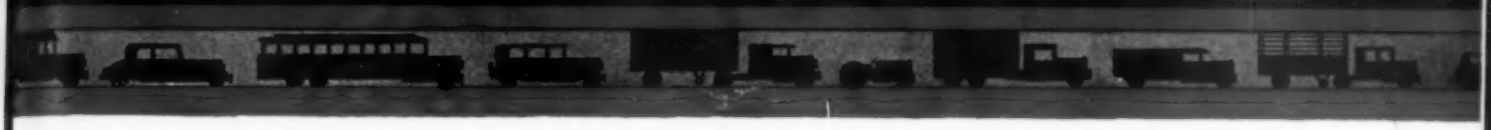
DECEMBER
1933

First Copy

FLEET OWNER

THE FERGUSON PUBLISHING CO., 90 WEST ST., NEW YORK, N.Y.

Devoted to the Better Operation and Maintenance of Truck, Bus, Taxicab, Passenger Car and All Automotive Fleets



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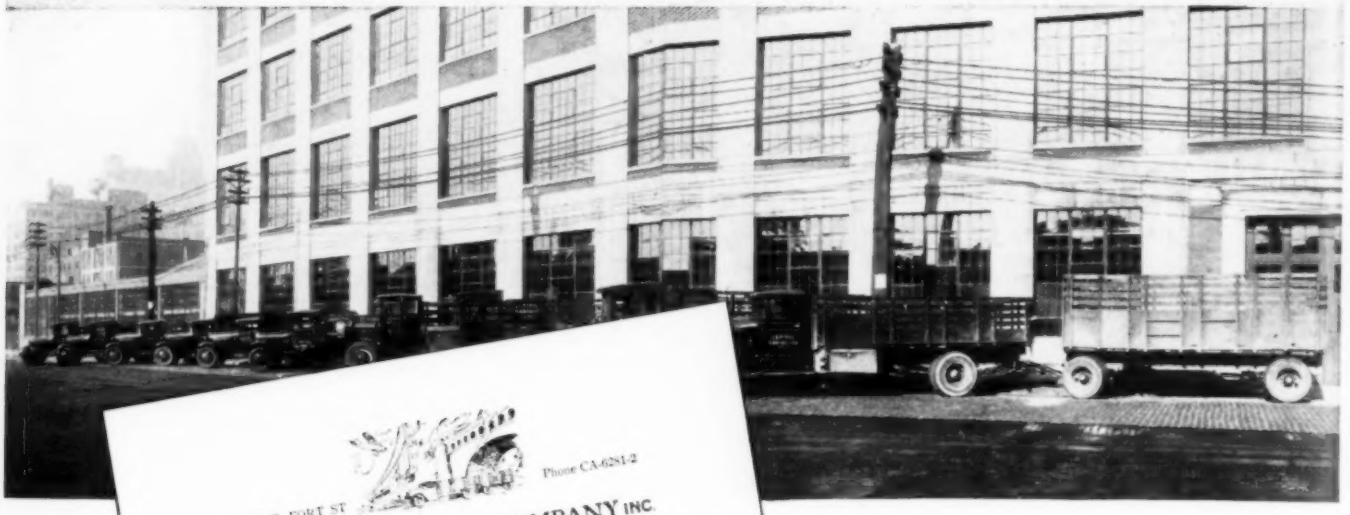
And Our Usual Departments

SAVED 10% to 40% on GASOLENE

Read this interesting letter telling experience of Central Cartage Company, Inc., with POWER PROVER Service.



1579 E. FORT ST. Phone CA-6281-2

CENTRAL CARTAGE COMPANY INC.
GENERAL CARTAGE CONTRACTORS
DETROIT MICHIGAN

September 21st, 1933.

Cities Service Oil Co.
3114 Cass Avenue,
Detroit, Mich.

RE:-POWER PROVER SERVICE.

Gentlemen:-

About three months ago we were approached by one of your representatives, Mr. Frank O'Riley, in regard to furnishing us with the above service.

After hearing some of the claims made by Mr. O'Riley relative to the savings that would accrue from having our various units Power Proved, we were at first inclined to be a bit sceptical, particularly when he made the assertion that he could promise an increase in gasoline mileage of from 10% upwards.

However, upon going into the matter further and viewing the various scientific instruments which have been perfected by the Cities Service Laboratories and having their particular function explained to us, we decided to allow you to Power Prove our equipment.

In the two months since your experts have completed their work, we have kept an accurate record of the performance of each vehicle and are very glad to state that all the claims made by Mr. O'Riley have been more than proved correct, as we have shown a saving in gasoline consumption ranging from 10% to 40% on our equipment, both light local units, as well as heavy highway units.

We therefore feel that in view of our findings your organization should be complimented for its work in making this saving possible to all users of motor vehicles if they will only avail themselves of the opportunity you offer in Power Prover Service, and you have our permission to use this letter if it will help you in carrying on your good work.

Again thanking you, we are

Yours very truly,
CENTRAL CARTAGE COMPANY, INC.
By. Edward Mart
President.

EM/C

ARE YOU SURE your fleet is not wasting 10% to 40% of the gasolene you buy for it? The POWER PROVER will tell you definitely in 30 seconds. The 23-step Cities Service Tuning Routine, using exclusive Cities Service tuning tools and precision instruments, eliminates needless waste of gasolene and oil...cuts maintenance costs . . . lengthens the interval between overhauls and gives protection against dangerous exhaust fumes. More than 2500 fleet operators have found these claims to be true.

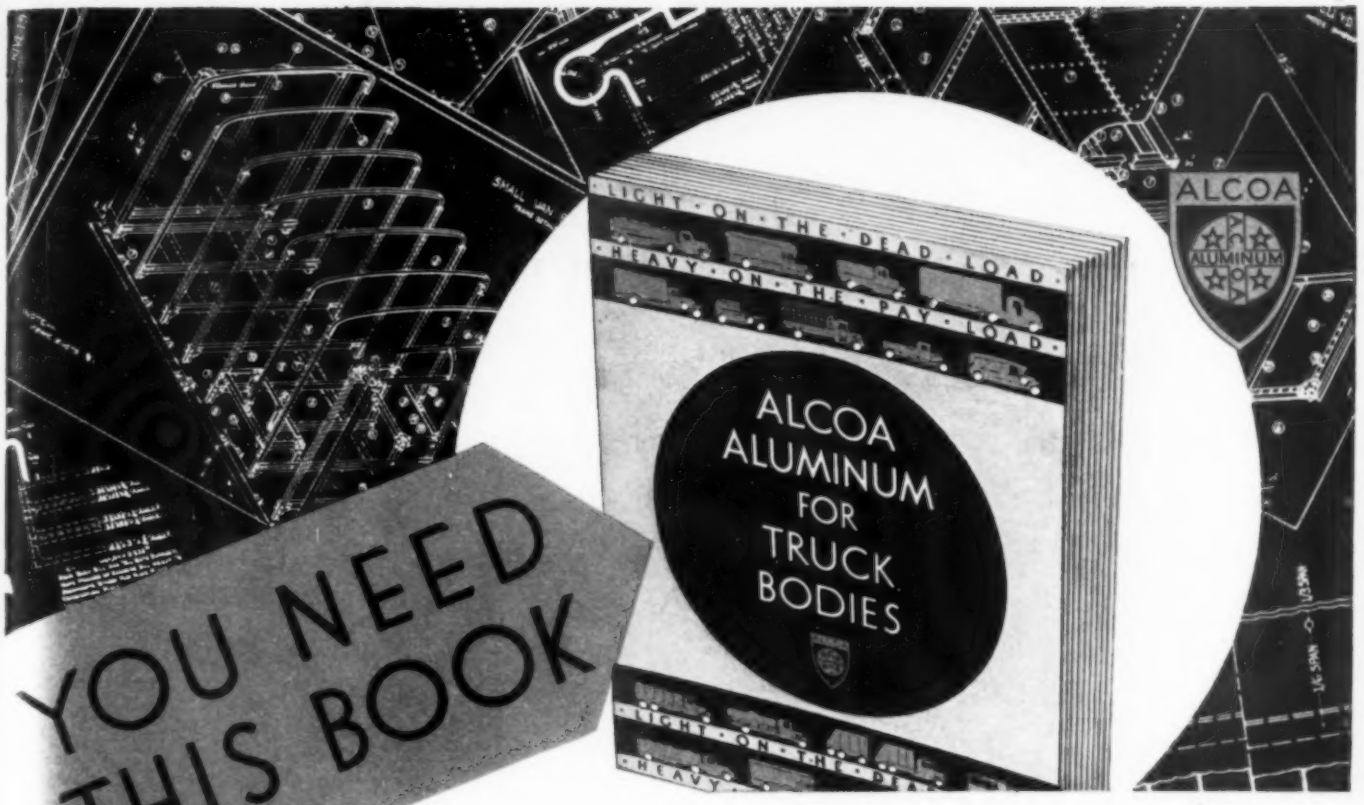
Save on your Fleet

Start saving at once on your fleet. Write, wire or phone for a demonstration of POWER PROVER Service on your own fleet. Address your request to Cities Service POWER PROVER, Room 702, 60 Wall Street, New York City.

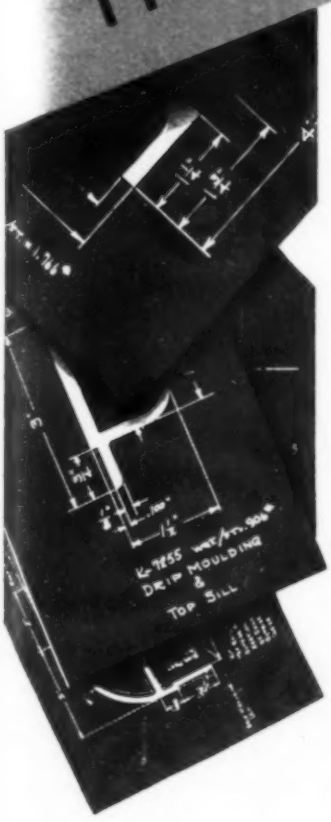
CITIES SERVICE OILS
ONCE - ALWAYS

CITIES SERVICE POWER PROVER

Cities Service Oil Company • Crew Levick Company • Cities Service Refining Company
Louisiana Oil Refining Corporation • A. R. Newcombe Oil Company



YOU NEED THIS BOOK



If you build, sell or operate trucks . . . bodies . . . or trailers you can have it — FREE!

Here's a handbook you'll read *and use with profit:* our new book "Alcoa Aluminum for Truck Bodies."

With detailed construction drawings, 17" x 23", printed on paper from which blueprints can be made, with more than 50 pages of actual facts and figures on cost and operation, this new book tells you all you want to know about aluminum truck bodies.

It gives actual operating and weight-saving-data (furnished by the operators themselves) on aluminum dump bodies, vans, gasoline, milk and other truck tanks.

It shows in detail how to build aluminum bodies for strength and long life combined with lowest possible weight. It shows which alloys of ALCOA Aluminum to use for each purpose and the various sizes and shapes available. Also notes and detail drawings of dump, van, freight, insulated and refrigerated bodies, with directions for fabrication, joining, painting and almost every construction process.

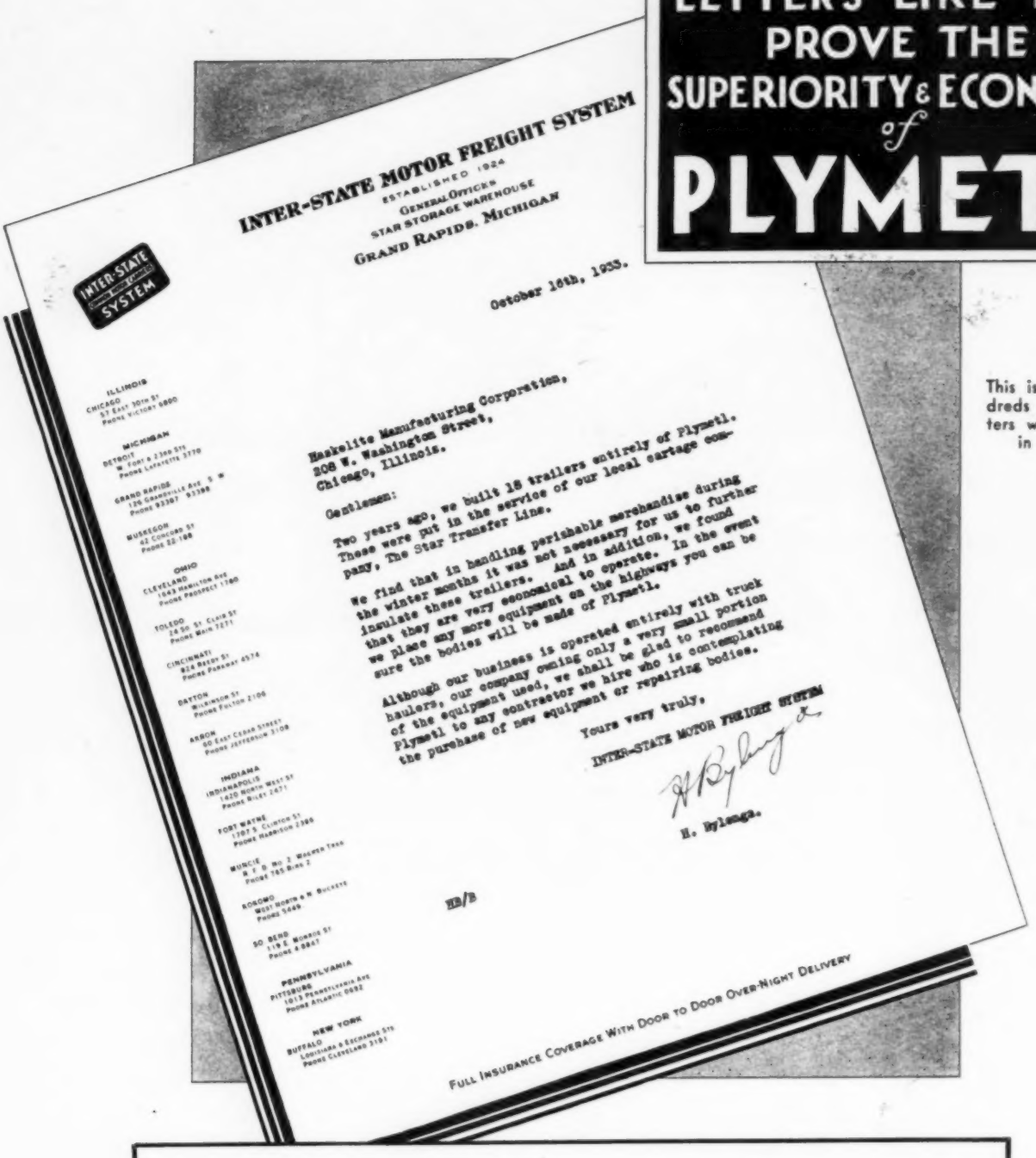
The supply is limited. Write for your copy today—on your business letterhead, please. Address ALUMINUM COMPANY *of* AMERICA; 1861 Gulf Building, PITTSBURGH, PENNSYLVANIA.

NRA

ALCOA ALUMINUM

Say "I saw it in FLEET OWNER"—It Helps!

LETTERS LIKE THIS PROVE THE SUPERIORITY & ECONOMY of PLYMETL



INTER-STATE MOTOR FREIGHT SYSTEM
ESTABLISHED 1924
GENERAL OFFICES
STAR STORAGE WAREHOUSE
GRAND RAPIDS, MICHIGAN

INTER-STATE SYSTEM

October 16th, 1933.

Haskelite Manufacturing Corporation,
208 W. Washington Street,
Chicago, Illinois.

Gentlemen:

Two years ago, we built 18 trailers entirely of Plymetl. These were put in the service of our local cartage company, The Star Transfer Line.

We find that in handling perishable merchandise during the winter months it was not necessary for us to further insulate these trailers. And in addition, we found that they are very economical to operate. In the event we place any more equipment on the highways you can be sure the bodies will be made of Plymetl.

Although our business is operated entirely with truck haulers, our company owning only a very small portion of the equipment used, we shall be glad to recommend Plymetl to any contractor we hire who is contemplating the purchase of new equipment or repairing bodies.

Yours very truly,
INTER-STATE MOTOR FREIGHT SYSTEM
H. Bylenga.

HB/B

ILLINOIS
CHICAGO
57 East 30th St
Phone Victory 6800

MICHIGAN
DETROIT
W. Fort & 23rd Sts
Phone Lafayette 3770

GRAND RAPIDS
126 Grandville Ave. S. W.
Phone 93267 - 93268

MUSKEGON
62 Conclins St
Phone 52-168

OHIO
CLEVELAND
1843 Hamilton Ave
Phone Prospect 1140

TOLEDO
24 So. St. Clair St
Phone Main 7271

CINCINNATI
824 Reedy St.
Phone Parkway 4574

DAYTON
Wilkinson St.
Phone Fulton 2106

AKRON
50 East Cedar Street
Phone Jefferson 2108

INDIANA
INDIANAPOLIS
1430 North West St
Phone Riley 2871

FORT WAYNE
1307 S. Clinton St.
Phone Harrison 2366

MUNCIE
R. F. D. No. 2 Hoosier Trail
Phone 765 Rich 2

ROSCOE
West North & N. Buckeye
Phone 5048

SO. BEND
119 E. Monroe St
Phone 4-8847

PENNSYLVANIA
PITTSBURG
1813 Pennsylvania Ave
Phone Atlantic 0682

NEW YORK
BUFFALO
Louisiana & Exchange Sts
Phone Cleveland 2181

FULL INSURANCE COVERAGE WITH DOOR TO DOOR OVER-NIGHT DELIVERY

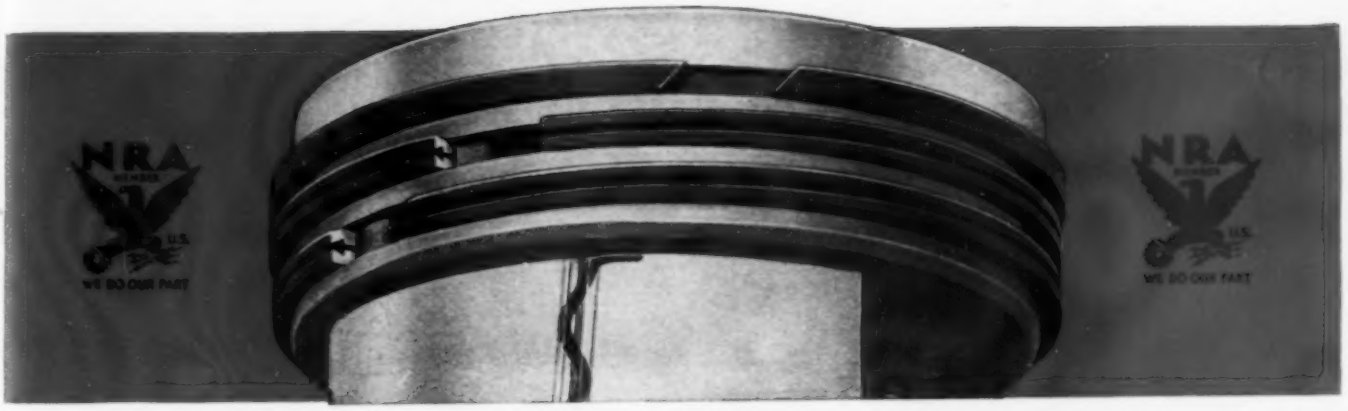
This is one of hundreds of similar letters which we have in our files.

Part of the fleet of PLYMETL paneled trailers operated by Star Transfer Line for the Kroger Grocery & Baking Co.

HASKELITE MANUFACTURING CORPORATION

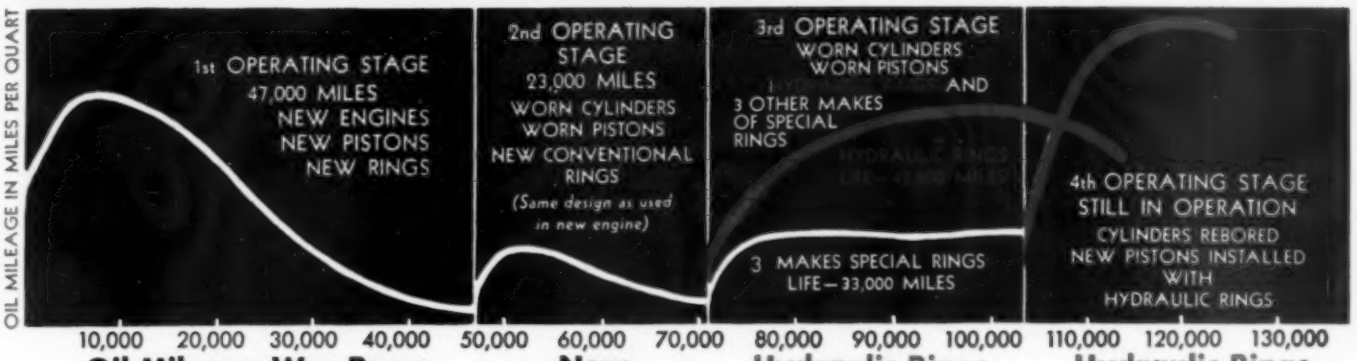
208 WEST WASHINGTON STREET, CHICAGO ILLINOIS.

Say "I saw it in FLEET OWNER"—It Helps!



HYDRAULIC ACTION

PROVED BY NEARLY *2,000,000 MILES OF ACTUAL ROAD EXPERIENCE



Oil Mileage Was Poor in New Engines

New Conventional Rings Failed

Hydraulic Rings Succeeded

Hydraulic Rings Perform Better Than New Engines

Pedrick

PISTON RINGS

2 Million Miles of Actual Road Experience. These are not laboratory results. They are the experience of a large public utility concern which made the installations in its own maintenance shops and operated the vehicles in their regular service. Actual field experience like this means infinitely more than any amount of laboratory testing.

Wilkening Manufacturing Co.
Philadelphia

Send for S.A.E. PAPER TODAY

The complete record of this road experience is detailed in this reprint of a paper delivered by D. D. Robertson, PEDRICK engineer, at the International Automotive Engineering Congress of the Automotive Engineers at Chicago, September 1, 1933. Send for your free copy.

WILKENING MANUFACTURING CO.
Philadelphia, Pa.

Please send me copy of your booklet, "Hydraulic Action in Piston Ring Design."

Name .....

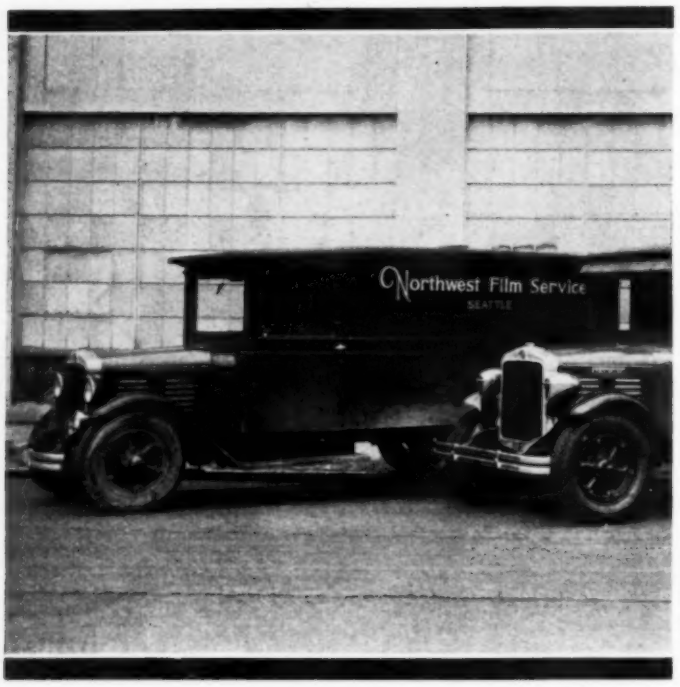
Address .....

City ..... State ..... FO

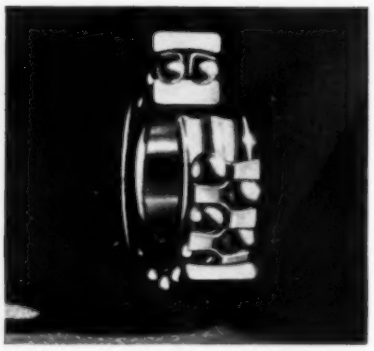
THE SKF GALLERY OF DISTINGUISHED PERFORMANCE USERS:

KENWORTH MOTOR TRUCK CORP.

"NEVER BEEN AN SKF CENTER BEARING FAILURE"



"EVERY day in the year"... these two Kenworth Model 70 trucks are on the job delivering motion picture films to theatres. They are part of a fleet doing 300 or more miles daily on this important work. Dependability... unquestioned... is demanded. If the films they carry did not reach their destination on time the film distributing company would be liable to theatres for loss of patronage. That is why Kenworth uses SKF Self-Aligning Bearings for the propeller shaft location.



Part of the route of these trucks includes mountain passes with elevations of 3000 to 4000 feet. During winter months the roads are treacherous. Yet, like the mail, schedules must be strictly kept. Despite high speeds and bad roads *"there has never been a center bearing failure on these trucks,"* says Kenworth. No wonder SKF Performance Takes Preference Over Price!

SKF INDUSTRIES, Inc.
40 East 34th Street, New York, N. Y.

3112

WHERE PERFORMANCE TAKES PREFERENCE OVER PRICE

●*You may buy a bearing as a bargain but try and get a bargain out of using it, for nothing is apt to cost so much as a bearing that cost so little*

SKF BALL AND ROLLER BEARINGS

The

FLEET OWNER

Published Monthly in the interests of Automotive Fleet Owners who maintain their own Repair and Service Shops and devoted to the better Operation and Maintenance of Truck, Trailer, Bus, Passenger Car, Taxicab and all Automotive Fleets.

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CCA

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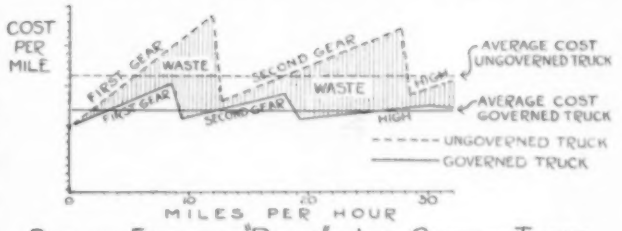
Stops Waste in city traffic as well as on the highway



SHOWING EFFECT OF "RACING" IN LOW GEARS IN TRAFFIC

Unnecessary "Racing" in Low Gears Causes Astonishing Waste

Even your best drivers cannot resist the temptation to race their engines in low gears, trying to beat traffic.

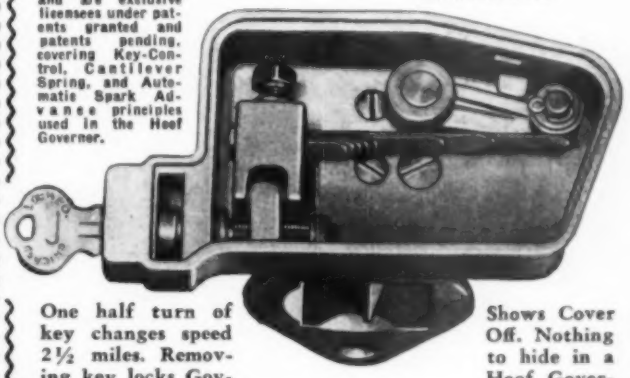
With no loss of pick-up or time in reaching destination, the Hoof Cantilever Spring Governor insures proper low gear operation, thereby saving you 25% to 40% in gasoline, oil, engine overhauling and general maintenance costs.

Investigate today—we will tell you why 391 national fleets are now using Hoof Cantilever Spring Governors.

HOOF PRODUCTS CO.

166 N. FRANKLIN ST. CHICAGO

THE HOOF PRODUCTS CO. own Patent No. 1,726,725 and are exclusive licensees under patents granted and patents pending, covering Key-Control, Cantilever Spring, and Automatic Spark Advance principles used in the Hoof Governor.



One half turn of key changes speed 2½ miles. Removing key locks Governor.

Shows Cover Off. Nothing to hide in a Hoof Governor.

The **HOOF**

CANTILEVER SPRING

GOVERNOR

adopted as standard on the World's largest fleet

Only

3 WORDS

DU PONT AUTOMOTIVE DULUX

... *but* THEY TELL A COMPLETE STORY ON HOW TO PROTECT TRUCKS AND SAVE MONEY

Long-lasting finish of du Pont Automotive DULUX protects tank wagons of the American Oil Company. DULUX is especially resistant to harm from gasoline and oil.

THREE WORDS point a way to keep trucks out of the refinishing shop and to get maintenance costs lower than ever.

The words are "du Pont Automotive DULUX." They form the name of a Pre-Tested finish that has proved its right to be called outstanding because of its exceptional durability.

When the American Oil Company looked for a finish that would stand the terrific wear and tear on gasoline tank wagons, they chose du Pont Automotive DULUX. Owners of trucks and commercial vehicles of all kinds see in DULUX advantages they have long sought in a finish.

Automotive DULUX is a finish so hard that it resists mechanical injury. It is flexible also, and stays flexible so that it does not crack, chip or flake. Its impermeable film resists corrosion. It is highly resistant to gasoline and oil. It dries quickly . . . is easy to apply in your own shop or to have applied by the Authorized du Pont Refinisher. It retains its original color and fresh appearance, eliminating need for frequent refinishing and touching up.

Best of all, you can depend on getting such a finish every time you use du Pont Automotive DULUX. It is a Pre-Tested product. Chemists tested every raw material needed for the selected formula. They put the finished product—Automotive DULUX—on wood and metal panels and exposed it for months to the weather. They applied it to trucks under actual conditions of use.

Today they are constantly checking production to see that the superior characteristics of Automotive DULUX are kept up to fixed standards. Pre-Testing is your protection against finishing troubles, failures and useless expense . . . your assurance that Automotive DULUX is an economical investment which pays for itself.

Let us supply Automotive DULUX for your fleet and also help you work out specification standards for refinishing. These specifications will establish definite procedure in your shop for getting the most satisfactory and economical job. For further information, address E. I. du Pont de Nemours & Co., Inc., Finishes Division, Wilmington, Delaware.

DU PONT AUTOMOTIVE

REG. U. S. PAT. OFF.

DULUX

Reg. U. S. Pat. Off.

Say "I saw it in FLEET OWNER"—It Helps!

World's Fastest, Finest Cylinder Hone

Nine of every ten cylinder reconditioning jobs can be done in your own shop with the HALL Model H Hone. No need to send these jobs out or purchase more expensive equipment. Model H HALL Hone costs less to buy and less to maintain.

Operates either wet or dry. Covers wide range; half-inch drill drives it; has Micrometer set; easy to expand or collapse; faster cutting, more accurate; produces glass-smooth, run-in finish; replacement stones are long-lived and low cost; extra stone carriers save time in changing stones. No extras to buy. Comes complete in metal box. HALL Honing Stand at $7.50 saves labor. HALL HonoVac (vacuum system) saves time in cleaning up after honing. Ask your jobber for special price on Hone, Stand and HonoVac when purchased together.

$45.00

An Elephant's PULL at your Finger Tips

A 100-ton HYDRAULIC pull that pulls any car or truck wheel without sledging, pounding or tapping or wedging. Impossible to damage gears, bearings, axles or wheels. Makes wheel pulling the easiest part of the job. Makes service easier and permits pulling wheels anywhere.

Every brake, axle, wheel bearing and grease retainer job demands a Wheel Puller. It's one of the most necessary pieces of equipment in the shop today. This 100-ton Puller uses a new, leak-proof material. A pair of hands and a wrench are the only tools required to use it. Can be bought in Master car or truck sets or Special Sets for any make or model. Each Adapter handles double the wheel sizes of other makes because double-threaded. Costs less too. Ask your jobber or write factory today for complete information.

HALL HYDRAULIC WHEEL PULLER

HALL PISTON PIN HOLE HONE

Why send pin fitting out of your shop or take a chance on trying to ream to size with dulled or nicked reamers? With the HALL Piston Pin Hole Hone any mechanic can be an expert pin fitter or it can be used to finish to size after reaming regardless of the condition of the reamer. Can also be used for rounding, trueing, enlarging or polishing small holes in any metal.

Sold in 3-tool sets covering two ranges: .730" to 1.135" (passenger car range) and .484" to .750". Complete set, either range, in metal box, with extra abrasives, $20. Heavy Duty type Pin Hole Hone, range, 1⅛" to 1¾" or 1⅝" to 1⅞", $25 each.

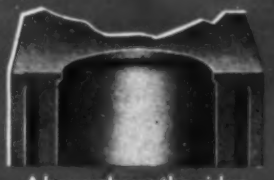
HALL MANUFACTURING COMPANY
1620 Woodland Ave., Toledo, Ohio
In Canada: Walkerville, Ont.

ASK YOUR JOBBER for the Pin Hones you need or write factory today for literature.

3 Tool Set $20.00

HALL Cylinder Piston Pin Hole HONE

Stop the "CLICKS" before they Start



Above shows the ridge which ring wear leaves at top of cylinder and which can be removed quickly and easily with the HALL Variable Depth Ring Ridge Reamer.

Filing the ring slot sufficiently to allow oversize rings to pass Ring Ridge makes it impossible to secure the fit the oversize ring was intended to give. With the Hall Variable Depth Ring Ridge Reamer ring ridges can be removed in few seconds. Placed in cylinder and expanded, a few turns with electric drill or ratchet and ridge is gone. That ring ridge is deeper on one side of cylinder makes no difference to the HALL. Reamer automatically stops cutting when ridge has been cut flush with cylinder wall.

Model 210
Range 2 11/16" to 4"
$12.50
Model 210A
Range 4" to 5"
$16.50

HALL MANUFACTURING COMPANY
1620 Woodland Ave., Toledo, Ohio
In Canada, Walkerville, Ontario

HALL Variable Depth Ring Ridge Reamer

Say "I saw it in FLEET OWNER"—It Helps!

"Another Shipment Late!"

..which might have been avoided by attention to a "trifling detail"

EVERY fleet owner knows that there are many unavoidable delays in the ordinary course of truck, bus or commercial-car operating—to say nothing of those which could be avoided through thoughtfulness of simple things.

"Flats" will happen—in spite of diligent servicing. But they'll happen less frequently if the tires are also given proper attention.

Make it easy for *drivers* to keep tires properly inflated and you further reduce tire trouble, prevent time-wasting tire changes and increase tire mileage.

Insure your tire mileage and operating schedules by equipping your tires with Schrader Dublcheks.

Schrader Dublchek is an ingenious valve cap for tire-valve stems. It makes inflating and air-gauging as easy as turning on a water tap. Affixed permanently, there's nothing to unscrew, replace or become lost. Air shoots in *right through* the cap.

Schrader Dublchek protects the inner-valve against dust and dirt. It is also an extra air-seal that's guaranteed airtight in itself—even under 250 lbs. pressure. Hence the name "Dublchek"—double protection.

Schrader Dublcheks cost so little and save so much—in tire mileage and in time and trouble enroute—that it is positively extravagant *not* to have them. More than a million already in use. Attached in a few moments. Get them thru your regular source of supply.

SCHRADER DUBLCHEK
VALVE CAP (No. 7006)

A SCHRADER'S SONS, INC.
Brooklyn, N. Y. Toronto, Canada
Makers of pneumatic valves since 1844

Schrader

Reg. U. S. Pat. Off.

TIRE-SAVING VALVES, CAPS AND GAUGES

BE SURE IT'S A SCHRADER—LOOK FOR THE NAME

Say "I saw it in FLEET OWNER"—It Helps!

Turning *emergencies* into mere incidents

A HIGH percentage of traffic accidents would never happen if all cars, trucks and buses had Bendix B-K Controlled Vacuum Power Brakes.

What would be a frightening emergency in a truck with ordinary brakes, becomes a mere incident, of trivial importance, in a truck with Bendix B-K Power Brakes.

Your trucks need Bendix B-K Power Brakes *to keep out of trouble.* It's mighty low-priced insurance in these days of doubled power, doubled speeds and constantly thickening traffic.

It's a tough job, tooling a heavy truck through a day or a night of street or highway travel. It takes muscle—lots of it. It's when the lads get tired, let down a bit, that the trouble starts.

Give them Bendix B-K Power Brakes and you save two-thirds—three-fourths—of the leg work. That's a big help to a driver who's trying to be careful and still make time!

Tractor-trailer service, particularly, needs these famous brakes, which are used on 96% of all power brake equipped vehicles. Laws in many localities are now so strict they virtually demand Bendix B-K stopping ability.

You can put Bendix B-K Power Brakes on practically any truck for very low cost. No disturbing of present braking system. The coupon will bring you all the facts.

BENDIX PRODUCTS CORPORATION
401 Bendix Drive, South Bend, Ind.
(Subsidiary of Bendix Aviation Corporation)

BENDIX PRODUCTS CORPORATION
401 Bendix Drive, South Bend, Ind.
Send full information regarding Bendix B-K Controlled Vacuum Power Brakes.

Name.....

Address.....

City..... *State*.....

Kind of Business.....

Makes and Models of Trucks.....

BENDIX

Controlled Vacuum

BK VACUUM POWER BRAKES A BENDIX PRODUCT

POWER BRAKES

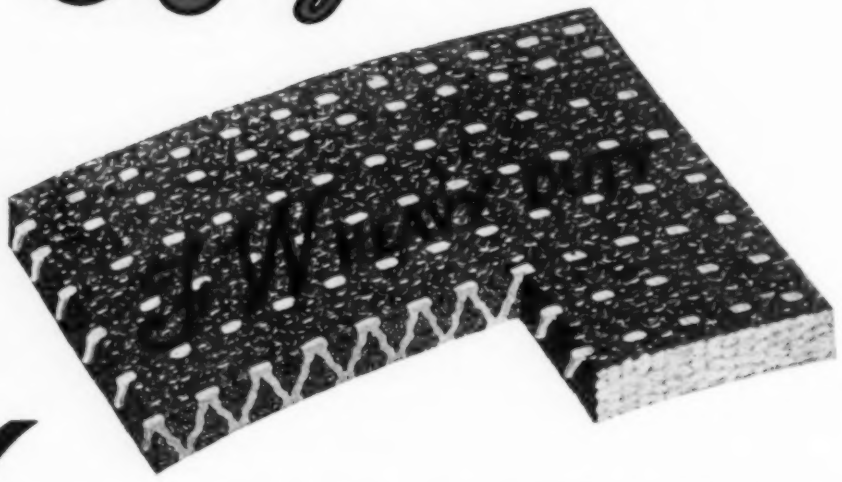
Say "I saw it in FLEET OWNER"—It Helps!

EASY PEDAL

LONGER WEAR

HEAT BRIDGE CONSTRUCTION

Raybestos



FW HEAVY DUTY

BRAKE LINING

"Easy pedal" is one of the many outstanding characteristics of this famous heavy-duty lining. This means less fatigue at the end of the day's run. It means, also, greater safety and real economy. Designed on the exclusive "heat bridge" principle, Raybestos FW Heavy Duty Brake Lining gives added mileage and higher efficiency because strands of large guage plastic metal run through the lining from one side to the other. These strands are in contact with the drum and the lining surface at the same time and heat radiates into shoe and adjacent parts. Here is a quality lining which commends itself to every driver and operator of heavy duty vehicles.

THE RAYBESTOS DIVISION of Raybestos-Manhattan, Inc. BRIDGEPORT, CONN.

Say "I saw it in FLEET OWNER"—It Helps!

VOL. 11
NO. 6

The FLEET OWNER

DEC.
1933

DEVOTED TO THE BETTER OPERATION AND MAINTENANCE OF TRUCK, TRAILER, BUS, TAXICAB, PASSENGER CAR, AND ALL AUTOMOTIVE FLEETS.

Stripping *the* Thread » »

(The Editor's Column)

Breathes there a man with soul so dead,
Who never unto himself hath said,
When on a bolt, he stripped the thread:
"*@... %x ')z**= v¼"*'25"**@**"

WE TAKE IT BACK

● Last month we related the experiences of a fleet which does its running repairs on the road. We said that we thought this idea was not so hot. There's more merit to it, however, than we imagined at first thought, since we've just contacted a bus operator that does this very thing and is doing nicely, thank you. The fleet runs directly between New York and Chicago and makes it in what is probably the shortest bus-running time. All drivers are given a lengthy maintenance course in the bus factory and are good mechanics as well as efficient drivers. They make their own road repairs whenever they become necessary. Slipping in a new connecting-rod bearing is no more difficult to them than changing a tire. Only a broken crankshaft or a stripped transmission would stump them. And the service? It's splendid. Road repairs are few and far between, the equipment is splendid-looking and performance is at a par with the best. The drivers are just as conversant on the subject of vapor-lock as they are on road or weather conditions. The whole idea seems to be a good one and if it works in the transportation of passengers, it should work easier in other lines. In case you are interested, the fleet we are referring to is called "Safe-Way Lines." They operate light, fast and flexible equipment in the form of Reo 15-passenger buses. They think that the light, low-cost, high frequency type of motor coach is ideal for this purpose.

●

THE MAN BITES THE DOG

● When a truck publication runs an article on truck tires, written by a man in the tire business, and even though the article contains lots of good "meat" on the subject, *that* is not news. In fact, some close-minded individuals would even brand it as publicity. But when a man in the *truck* manufacturing industry writes about tires, that *is* news. There can be no essence of publicity to his offerings, particularly if he refrains from talking about his own trucks. And that is exactly what we are handing out to you this month on page 20, the contributor of which is none other than W. F. McAfee, manager of motor truck sales for International. We're sure you'll find his advice on reducing truck tire costs very valuable. You'll be reading it, won't you?

●

WE SPOIL A SALE

● Those of you who replied to our Questionnaire on Refrigerated Bodies have long since received your tabulated resumé of the returns. One fleet operator used his copy as ammunition with which to resist a persistent salesman, leaving said salesman out in the cold, practically perplexed, and without a single argument left in his hat. Here are the details, but 'twould be unethical to mention any names. It seems that a large operator was ready to have some new refrigerated bodies built by his local builder, and said salesman had him completely sold on his particular insulation material, to the point that he was ready to place the order. Along came the tabulated resumé that we've been talking so much about, and it revealed the interesting fact that but 3 out of 50 fleets were using this particular insulating material. "How come?" said the fleet man. "Guess your stuff is not so popular as you have claimed." Now friend salesman has to begin all over with his sales procedure, and he'll be lucky indeed if he gets the order at all in the face of the fact that so many operators are using competitive insulating material, and prefer it. Our advertising manager wants us to say "That's what he gets for not advertising it in FLEET OWNER", but we won't say it. We apologize, Mr. Insulation Maker, if we've spoiled your sale, but facts are facts, and we're here to dish them out as fast as we can gather them in.

●

IT IS THE LAW

● No doubt you have observed our new page of legal reports, appearing now and then, under the title of "John Law Sez:" But don't get us wrong. These are not expressions of opinion of the publishers of this journal, nor do we sponsor or guarantee their legality in any way. Let us make no bones about it and tell you frankly that we haven't added any legal solons to our editorial staff. We're just passing along digests of interesting court decisions which the National Highway Users Conference has dug up for the benefit of highway users in general. The appearance of this department in FLEET OWNER is somewhat in the nature of an experiment. If we can get enough interested readers to write us a letter telling us whether or not to continue it, we'll be glad to act accordingly. What do you say, Gentlemen?

●

GREETINGS!

● This publication will probably be in your hands much too early to carry a Christmas Greeting, but let us now sincerely extend our Best Wishes for both that Holiday and the New Year that is just around the corner. That, folks, is one of the penalties a publication pays for coming off the press on time.

●

H. Clay Fischer
Editor

●

By L. V. Newton,
Byllesby Engineering & Management Corp., Chicago, Ill.

Effecting Economies *in the* Fleet

Article III: Repainting • Another Portion of Mr. Newton's Comprehensive Paper Presented Before the S. A. E. Automotive Engineering Congress

THE cost of repainting motor vehicles in any fleet depends primarily upon the age of the fleet and how much "appearance" is valued at, or in other words, how often the vehicles are repainted and the type of painting scheme and nature of materials employed.

During "hard times" many companies neglect to repaint their vehicles as often as they should. No company can afford to neglect the appearance of its vehicles. Often the vehicle and the driver are the only physical tie that a business house has with its customers. The appearance of the vehicle does much to mould the public's opinion of the concern that owns it.

Aside from these considerations, good paint is essential to preserve the surface of the vehicle against the elements—further, the psychological effect on the driver or operator is marked. Invariably, they will treat a well painted vehicle more carefully than one whose appearance is bad.

Until about ten years ago the only widely used system of painting automotive equipment was the varnish system, an inheritance from the days of carriage painting. This system entailed the use of primer, surfacer, flat color, color varnish, perhaps rubbing varnish, and clear finishing varnish. It was the same system that was used on passenger cars, but curtailed by reducing the number of surfacing coats and also reducing the number of color varnish and clear rubbing coats. A typical finish would consist of: 1 coat Red Oxide Primer Glaze; 2 coats Gray Surfacer; 1 coat Flat Color; 1 coat Color Varnish; and 1 coat Finishing Varnish.

All materials were slow-drying and the minimum time in which a job could be turned out was 10 days to 2 weeks. With the exception of the primer and surfacer, brush application was most practicable. Much time was required for the rubbing and sanding operations. Extreme care was required to obtain a reasonably clean job, due to the slow setting of the rubbing and finishing varnishes. Judged by present standards the durability of the job was only fair at best; frequently poor. In short, the system produced excellent initial appearance but was slow, expensive and unsatisfactory in durability.

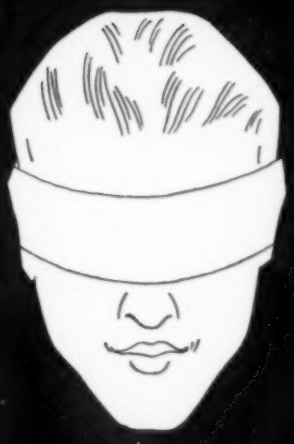
The year 1923 witnessed the introduction of colored nitrocellulose lacquers for production finishing of passenger cars. During the ensuing two years these made a practically complete conquest of the production passenger car field. No sooner was lacquer well established in the passenger car field than it began to spread to commercial vehicles, both factory jobs and repaints. A number of shortcomings then became manifest. Probably the most serious was the unsuitability of the typical automobile lacquer for use on wood and fiber-board, which were extensively used in the bodies of commercial vehicles. Another adverse property was deficiency in gloss. In their natural, unpolished state, the typical lacquers had only an eggshell gloss. The design of some commercial vehicles made polishing difficult and some classes of work would not stand the cost of polishing. Lacquer proved high in total cost, due to higher material cost, greater number of coats, need for more careful cleaning of the surface and better surfacing; also due to loss of material in spraying.

The typical automobile lacquer is a minor factor today in the repainting of trucks although it is still used for the factory painting of light, all-metal delivery trucks and is extensively employed for painting metal bodies. The requirements for this work are much the same as for passenger cars, but the surfacing need not be done as carefully and the polishing operation is eliminated or reduced.

Lacquer manufacturers undertook to overcome the handicaps to the more general use of lacquer through the development of so-called "commercial" lacquers, which were offered about 1928. These lacquers were a cross between a typical lacquer and an oil enamel. Like other lacquers, they contained nitrocellulose and hence set quickly. They differed from ordinary lacquers in that they contained a large amount of linseed or similar drying oil. The oil imparted sufficient elasticity to permit of use on all surfaces. On wood and composition it was necessary that the primer and surfacer be oil base, which made the system little if any quicker than oil enamel. The body and gloss were better than in a typical lacquer, but by no means

The newer synthetic finishes incorporate most of the properties desired for automotive work. They are suitable for use on wood as well as metal. All of them are designed for spraying and some of them may be brushed.

(*Cont. on page* 39)



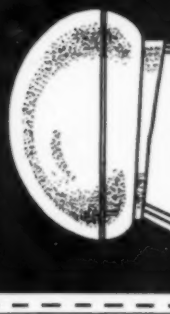
Would you be willing to drive BLINDFOLDED *even for half a minute?*

DRIVE blindfolded for half a minute? Why, it would be suicidal to try it even for 10 seconds. Yet every time a bus or truck driver sets out for a night's run, he is taking a similar risk.

Now Bosch introduces a new product that ends this danger of night driving: the Bosch Ditch and Fog Light—with the *triple* beam. It spreads almost a semi-circle of light . . . a *semi-circle of safety* around the front of the car. It penetrates "pea-soup fog" . . . counteracts the blinding beam of oncoming headlights . . . lights up the road to the left, to the right and straight ahead . . . without danger of glare to cars coming the other way, without danger of driving into curbs or gutters or ditches.

Fleet operators are welcoming this new light that removes the dangerous tension and strain of night driving . . . that makes night schedules as certain as day schedules. Mail coupon below for additional information about the only fog light with the triple beam.

UNITED AMERICAN BOSCH CORPORATION
SPRINGFIELD, MASS. New York Chicago Detroit
Canadian Warehouse: Toronto, Canada



BOSCH DITCH & FOG LIGHT *with the* TRIPLE BEAM

UNITED AMERICAN BOSCH CORPORATION, SPRINGFIELD, MASS. SEND BOOKLET ON SUBJECTS CHECKED:

PRODUCTS manufactured by ROBERT BOSCH A. G., bear trademark shown above. Sold by United American Bosch Corporation.

PRODUCTS OF ROBERT BOSCH A. G.

- ☐ Bosch Ditch & Fog Light
- ☐ Bosch Windshield Wipers
- ☐ Bosch Pyro-Action Spark Plugs
- ☐ Bosch Rapid Transit Magnetos
- ☐ Bosch Volt-O-matic Generators

PRODUCTS OF UNITED AMERICAN BOSCH CORPORATION

- American-Bosch Big Brute Coil ☐
- American-Bosch Condensers ☐
- American-Bosch Battery Charger ☐
- American-Bosch Magnetos ☐
- American-Bosch Car-Radio ☐ (25)

PRODUCTS manufactured by the UNITED AMERICAN BOSCH CORP., bear the trademark shown above.

WRITE NAME AND ADDRESS IN SPACE BELOW

Say "I saw it in FLEET OWNER"—It Helps!

Preventing Accidents in Bus Fleets

Safety Director, In Talk Before American Transit Association, Outlines Greyhound's Program of Driver Instruction and Training

By Marcus A. Dow

Manager, Department of Safety and Personnel, Greyhound Lines

AN incompetent bus driver is a costly individual to have on the payroll. In the twinkling of an eye he can make a mistake that might cause more damage than his wages for years could pay for. The selection of the right men for such work is, therefore, of the utmost importance.

He is in sole charge of an expensive piece of equipment loaded with human freight, travelling over public roads that are crowded with other vehicles operated by all kinds of drivers who may be good, bad or indifferent. The bus driver must be a dependable employee who can be counted on to not merely refrain from recklessness himself, but also to protect his vehicle from the reckless driving of operators of other vehicles.

Of course, the physical and mental condition of the man seeking employment as a bus driver must receive first consideration. Before spending time and money on a physical examination, it is well to find out if the candidate can drive. And so to find out if the prospect has at least the elementary qualifications necessary for a drivership, he is sent out with an experienced driver in an empty bus. If the old driver's report is favorable he is then sent to one of the doctors designated by the company for a physical examination. If the doctor's report is satisfactory, the candidate makes out a formal application and the Department of Safety and Personnel starts its investigation of the candidate's references to find out whether the man has a satisfactory past record as to safety, honesty and dependability.

Lady member of Greyhound force showing one of the drivers how to use new drivers' inspection mirror.

During the progress of this investigation, which takes at least two weeks, the candidate who is now a student driver spends seven days at the drivers' training school located in Cleveland, Ohio. Here class lectures consist of instruction on safety in operating rules by the Manager of Safety and Personnel, mechanical and maintenance lectures by a mechanical expert, driving talks by a driver instructor and ticket and tariff lectures by a traffic department man. Half a day each day is spent in the classroom and the other half is spent in the field by the entire class which is taken out in a special bus by the driver instructor. Under his appraising eye each student must drive the bus for at least a half hour each day. While not actually driving, the other students must pay close attention to instructions being given to the one who is driving.

His instruction is practical and thorough, not only on the rules of the road and safe driving practices but in mechanical work as well. Road failures and their attendant high costs have been reduced to a minimum in all regions by the teachings that student drivers receive on how to make emergency adjustments and repairs. During this period the students are required to get out and actually fix the bus which has purposely been crippled so as to give them actual emergency repair experience.

At the completion of the schooling two written examinations must be passed by each student. One is known as "The Safety Questionnaire" and the other as the "Mechanical Questionnaire." If the student passes these tests he is sent to the manager of the department of safety and personnel for final approval.

He is not yet ready for actual service, however. He must spend at least two weeks riding with regular drivers on passenger trips for the purpose of thoroughly learning the routes over which he is to operate. During this period the regular drivers must make out

(*Please turn to page* 40)

Is He a Good Driver?

EVERY applicant for a driver's position with the Greyhound Lines, must spend a two weeks' period driving with old, experienced operators of the company who keep a close check on violations of any of the following unsafe practices:

Excessive speed.
Nervousness.
Not cautious approaching intersections.
Takes curves too fast.
Takes curves on wrong side of road.
Does not descend hills in gear.
Passes overtaken cars near crown of hill.
Does not handle gears properly.
Starts with a jerk.
Makes stops out of gear.
Does not slow down passing schools.
Turns head while driving.
Talks too much.
Does not keep to right side of center line.
Follows other car too closely.
Passes overtaken cars without caution.
Conduct at railroad crossings:

(a) Failed to stop.
(b) Did not look both ways.
(c) Stopped too close to tracks.
(d) Stopped too sudden—not gradual.
(e) Did not open door.
(f) Shifted gears before completely crossing over.

For the 4th Consecutive Year

J-M Brake Linings play their part in a Prize-Winning Performance

FOR four consecutive years, one or more of the winners of the coveted Bus Transportation Awards have been users of J-M Brake Linings.

In some instances J-M Brake Linings were used 100% by the winning companies, in other instances a lesser number of busses were so equipped. But always, our linings have contributed materially to the prize-winning performance. By rolling up impressive brake-mileage figures. By insuring the smooth, trouble-free braking indispensable to safety of operation, regularity of schedules, economy of maintenance.

The Washington Railway & Electric Company, winner of this year's Class A Award for City Companies, has standardized on J-M Brake Linings for its Type W Yellow Coaches.

A preference based on results obtained in the most rigorous of city service. Last year these Type W's operated over the most congested of all the Washington Railway & Electric Company's routes. Stopping safely, starting smoothly, establishing outstanding records for minimum pull-ins, low maintenance costs.

Many of the country's finest fleets of trucks as well as busses date their freedom from brake troubles to the installation of J-M Brake Linings.

A trial installation will convince you, too, that J-M Brake Linings help lower brake costs, increase brake efficiency. At your request, we will provide the services of a J-M Brake Expert to supervise such a trial installation, and at the same time to offer helpful co-operation in the correction of any of your particular brake problems. Mail the coupon to Johns-Manville, 22 East 40th St., New York City.

Johns-Manville

BRAKE LININGS

124-PAGE RELINERS MANUAL FREE

The J-M Brake Reliners Manual brings you 124 pages of helpful facts on relining, adjusting, trouble-shooting. Invaluable aid in the solution of common and uncommon brake problems. *Free.* Mail the coupon.

Johns-Manville, 22 East 40th Street, New York City

Check service desired.
( ) Send a J-M Brake Expert.
( ) Send me free copy of the J-M Brake Reliners Manual.

Name _____

Address _____

City _____ State _____

FO-12-33

Say "I saw it in FLEET OWNER"—It Helps!

WHEN White BUILDS A TRUCK TO SELL FOR $1085 CHASSIS AT FACTORY

CHASSIS AT FACTORY

That's News!

Designed for today's market of more than 100,000 truck users who need it—Priced in anticipation of widespread replacement buying. Only volume production can make this low price possible.

NEWS... BIG NEWS!... A White truck White *designed* and White *built* throughout—at an astoundingly low price.

NEWS—because never before has the low price field had a precision built truck of 8,000 to 11,000 lbs. gross with Stellite screwed in exhaust valve seats—rifle drilled oil passages to all main bearings and connecting rods... four wheel, automatically equalized power assisted hydraulic brakes ... safety springs... modern chassis arrangement permitting greater payload space on shorter wheelbase ... with all principal engine and chassis parts heat treated. Only White with its 30 years of experience in building quality trucks could offer such an outstanding value.

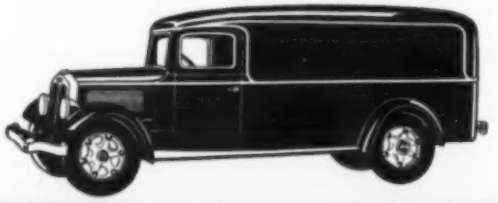
At anything less than volume production this new White could not be built to sell under $2000. The much needed replacement of trucks has already started and will steadily increase. Confidence in greater buying activity determined the low price of $1085. Buying now offers protection against the trend toward higher prices.

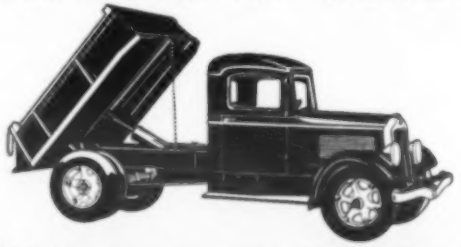
Telephone the White Branch or Dealer in your city and arrange for demonstration.

THE WHITE COMPANY • CLEVELAND

Say "I saw it in FLEET OWNER"—It Helps!

1. **75 H. P.—6 Cylinder Engine** ... White designed and White built to give brilliant performance ... speedy, flexible, with unusual economy.
2. **Real Economy**... In the 240 cubic inch engine White has combined *small engine* economy with *big engine* power and acceleration. You pay no penalty for brilliant performance. Here is a power plant that sets a new standard for real economy.
3. **Greater Payload per Wheelbase** ... New arrangement of chassis parts provides more loading space with shorter wheelbase. The engine is recessed giving maximum accessibility with perfect insulation and ventilation for driver comfort.
4. **Hydraulic Brakes with Reaction Type Booster** ... Quicker, safer stops. Automatically applies equal pressure to all four wheels. Easy to apply and keep in adjustment. Gun iron drums assure long life to brake linings.
5. **Safety Springs** ... Double wrapped eyes are used to assure greater safety. Helper springs are used in rear for severe operations and easy riding under light load.
6. **Stellite Valve Seats** ... White pioneered these screwed in type 100% alloy valve seats. So far ahead of other types that valve grinding and tappet adjustment are practically eliminated.
7. **Full Pressure Lubrication** ... Rifle drilled passages to all main bearings, connecting rod bearings and wrist pins. A long life feature new to the low price field. Special pump intake and oil filter assure only clean oil.
8. **Counter Weighted Balanced Crankshaft** ... A White designed crankshaft that assures low bearing pressures and long life. A vibration dampener eliminates vibration at all speeds.
9. **Four Speed Transmission** ... Driver control is simplified by easy shifting. Gears are nickel alloy steel. Double heat treated and case hardened for long life.
10. **Full Floating Rear Axle** ... Special White design. One piece housing. Spiral bevel gear reduction supported against deflections by straddle mounted pinion. Gears heat treated and case hardened.
11. **Low Prices** ... Model 701—8,000 lbs. gross. Wheelbases 132-156—$1085. *(Chassis at Factory)* ... Model 702—11,000 lbs. gross. Wheelbase 132-156—$1185 *(Chassis at Factory)* ... Liberal terms can be arranged.



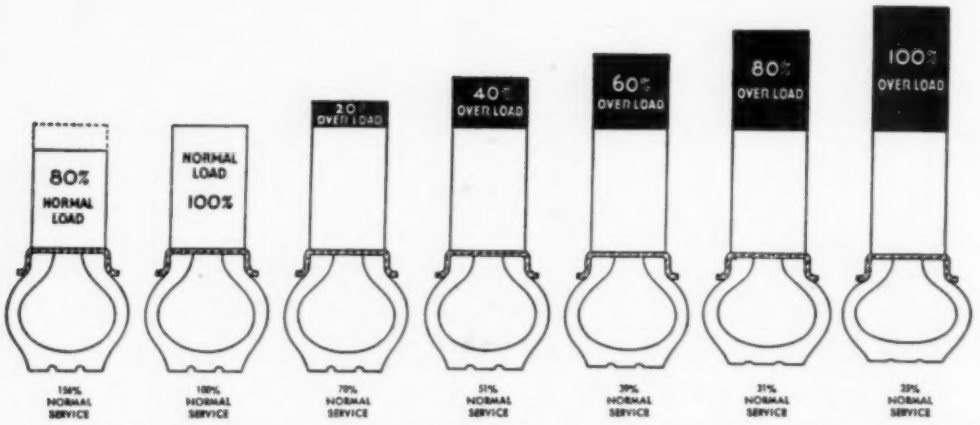


The NEW White

8,000 TO 11,000 LBS. GROSS

LAUNDRIES • DEPT. STORES • BAKERIES • BOTTLERS • NEWSPAPER • ICE CREAM • MILK • LIVE STOCK • HIGHWAY MAINTENANCE • PETROLEUM PRODUCTS • FOOD • FLORISTS

Let's Think About Tire Mileage



This load and service diagram illustrates the effect of overloading on the ultimate service of a pneumatic tire. For example, a tire will give 100 per cent or normal service if its rated carrying capacity is not exceeded. However, if overloaded 20 per cent it will only give 70 per cent normal service, etc. The total mileage obtainable is dependent also upon other operating conditions, such as speed, road surfaces, braking, alignment, inflation, and proper repairs.

By W. F. McAfee,

Mgr. Motor Truck Sales, International Harvester Company

TIME and time again requests, and even urgent demands, are made by operators for tire adjustments, when as a matter of fact there often isn't the slightest justification for such action.

The adjustment situation at times borders along such unwarranted lines that it develops into an abuse which is absolutely unfair and manifestly an imposition upon the tire companies supplying equipment for trucks.

When premature failures in tire equipment occur, the companies supplying such tires are ready and willing to go over the situation, make helpful suggestions that would have a tendency to avoid a recurrence of the difficulties and if an adjustment of some sort is due the operator it will be made.

But right here I am desirous of stressing a very important point. The tire companies can't, and we should not expect them to, replace tires which fail prematurely through misuse, neglect and injury. Our policy for handling complaints on our own product is precisely the same and we can not ask tire manufacturers to do anything we will not do ourselves.

The tire companies have no desire to evade responsibility for tires which fail from defective material or workmanship. I am sure they will willingly continue to make proper restitution for any such product. But by far the greater number of truck tires which fail are put out of service prematurely because of operating conditions, and in contacting the tire companies for such cases we must be reasonable and not expect them to do the unreasonable.

Each size tire has a definite carrying capacity and only by weighing the load per axle can the proper size be determined. Truck operators cannot afford to guess at tire requirements. See insert.

Truck owners should never lose sight of the fact that there are many considerations to be taken into account if maximum mileage and uninterrupted service are to be obtained from truck tires, and in my opinion the three outstanding contributions toward prolonging the life of a tire are *prevention of overloading, underinflation and overinflation.*

If truck operators will carefully observe the situation to remedy the three problems mentioned, I feel sure they will experience very little difficulty in getting highly satisfactory mileage out of their tires.

It is obvious that every time a truck is burdened with an overload, the life of the tire is reduced. It is estimated that 40 per cent of a tire's life is lost due to 30 per cent overload. Each size tire has a definite carrying capacity, and only by weighing the load per axle can the proper size be determined.

The answer to overloading is easily arrived at—excessive flexing, which causes friction heat and undue stress on the cords and carcass. These impositions on a tire naturally lead to breaks in the fabric or to blowouts. More rapid tire wear is bound to come to the tire that is overloaded.

When a truck operator subjects his tires to abuses of that kind, is he within the bounds of reason when he

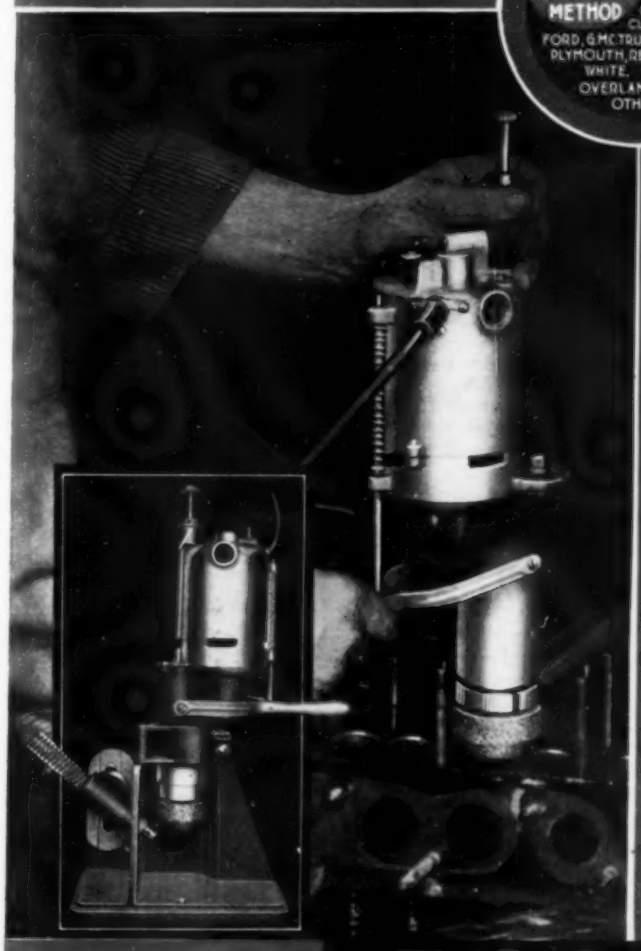
GENERAL MANAGER:

"HOW DID THAT TRUCK WITH HARDENED VALVE SEAT INSERTS WORK OUT?"

MAINTENANCE SUPERINTENDENT:

"THIS IS IT RIGHT HERE . . . . LOWEST GAS COST PER TON MILE OF ANY TRUCK WE'VE GOT . . . . ALMOST 50,000 MILES BEFORE WE TOUCHED THE VALVES."

HALL ECCENTRIC VALVE SEAT GRINDING METHOD ADOPTED BY..... CHRYSLER, CONTINENTAL, CURTISS-WRIGHT, FORD, G.M.C. TRUCK, HALL-SCOTT, PLYMOUTH, RENAULT, REO, WHITE, WILLYS-OVERLAND AND OTHERS



MANAGER:
"How's she perform since you serviced the hardened seats?"

SUPERINTENDENT:
"Swell! . . . . but not until after we'd tried and rejected a lot of different equipment . . . Finally we tried the ECCENTRIC Method that the factories use in their production . . . . now she's good for close to another 50,000 miles without touching the valves."

MANAGER:
"Guess we better make sure any new equipment we buy has these hardened seat inserts."

SUPERINTENDENT:
"RIGHT! . . . . and I'm sending through a requisition for a HALL Valve Seat Inserter so I can put hardened seat inserts in every one of our cars and trucks now in service."

MANAGER:
"Good work! Give me that requisition . . . . I'll OK it right now."

If Valve Seat Insert installation, replacement or grinding to production standards is a problem with you, you need HALL equipment. See it at your Jobber's or write the factory today for descriptive literature.

THE HALL MANUFACTURING COMPANY
1620 Woodland Ave., Toledo, Ohio

HALL Valve Seat inserter counterbores block, inserts standard or oversize seat and spins metal around seat to form permanent trouble-free installation.

HALL E-S Grinder as supplied with Diamond Dresser and in use on Pilot in valve guide.

HALL ECCENTRIC Valve Seat Grinder

HOW TO REDUCE YOUR TIRE COSTS (*Continued*)

When trucks equipped with dual tires are used on crowned roads or sufficient load is carried to spring the axle, most of the weight is thrown on the inside tire, causing it to be overloaded. This results in an unnatural wiping of the inside shoulders and leads to a breaking down of the fabric and premature failure.

asks for an adjustment? The operator should know that overload and underinflation squeeze the sidewalls of the tire outward, turning the shoulder of the tire tread down against the road.

I recall a complaint made not long ago by a truck operator who said he did not overload his truck. And he asked for the replacement of two tires. After considerable investigation I found that this operator really hadn't been overloading his truck, but he hadn't been properly loading it. He had been in the habit of putting much the greater part of the load on the rear tires.

Operators should remember that heavy material should be placed in the front of the body for better distribution of weight, both front and rear. The operator I have just referred to had no just grounds for complaint and, after considering the situation from various angles, and getting our viewpoint, he frankly admitted that he was to blame and that the difficulties he had experienced were not attributable to faulty material or construction.

Again, many complaints coming from truck operators would never have been filed if their tires hadn't been overinflated. Overinflation is an evil that wrecks tires day after day. The increased air pressure causes unusual strain on the tire's carcass—and I don't care if the truck is loaded or not loaded. Therefore, what must occur if the truck is over loaded? Isn't it clear that this strain on the tire is greatly increased—and with the attendant increased damage to the tire?

Countless tire failures can be attributed directly to improper size rims, yet many truck operators have not given this phase the consideration it deserves. It stands to reason that a tire mounted on an undersize rim actually can not get the rim support necessary. For example, a tire on too small a rim is destined to be broken on the shoulder, due to an excessive amount of flexing, and in addition to this abuse it is practically certain to be broken above the rim flange.

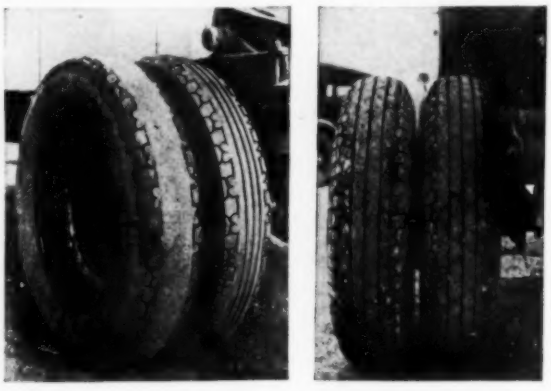
Care should be taken to see that dual tires are properly matched. The more worn tire should be placed on the inside —never on the outside. Unequal inflation is another feature that should be watched, because it causes the same result as improper matching. Very often a tire is literally scraped off by running on a wheel that is out of line, and a feather edge on one side of the tire tells the cause of quick tread wear — misalignment. Still, many truck operators do not consider these important points, and when their tires "go bad" they immediately rush to the dealer or manufacturer for an adjustment.

It is true that the remedies applied might not correct the difficulty 100 per cent, but it is a settled fact that they do help

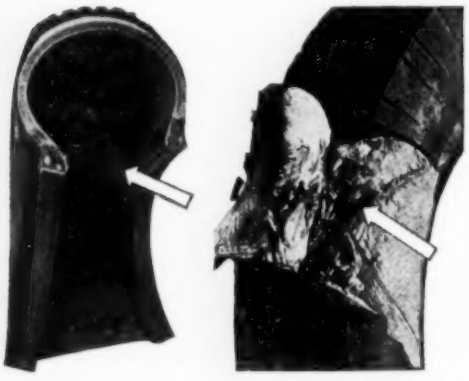
(*Please turn to page* 41)

Uneven Tread Wear

On the underinflated or overloaded tire the shoulders are subjected to a wiping motion and at each revolution of the wheel, scuff off the tread rubber at the shoulders of the tire. See the worn tire at the right.



Worn tires are smaller in outside diameter than new tires and should never be placed on the outside of a dual wheel with a new tire on the inside (see illustration on the left). To do so overloads the new tire, breaks down the fabric, and causes uneven tread wear. The more worn tire should always be placed on the inside. The illustration on the right shows both tires carrying an equal share of the load. Unequal inflation will bring about the same result as improper matching.



These failures are brought about by sustained high speed or overload. Such operating conditions develop excessive heat and build up the air pressure. The heat weakens the tire while the increased pressure stretches the fabric so tightly that it cannot flex normally. The result is a large blowout. Balloon tires are less susceptible to this condition.

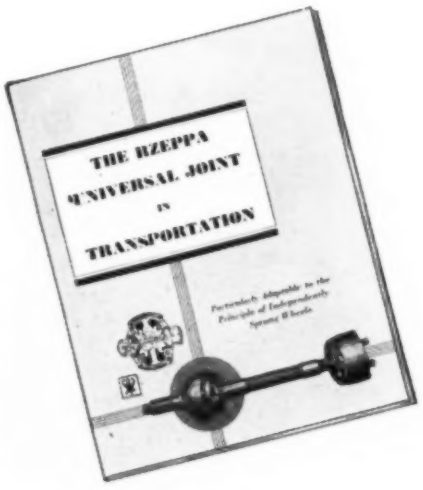
Check air pressure daily. These fabric breaks are the direct result of excessive flexing and heat produced by overload or too low air pressure. For best results, make sure the truck is equipped with tires large enough to carry the load and that the tires are mounted on proper size rims.

The UNIVERSAL JOINT that is JUST WHAT the FLEET OWNER ORDERED

80% *Want a Better Truck Joint. Rzeppa Joints Available for any Motor Vehicle.*

NRA MEMBER U.S. WE DO OUR PART

Especially adaptable to the principle of individually sprung wheels



Send for this Book

For 25 years, this company has been building precision equipment. All the engineering skill acquired during this quarter of a century is available in the building of Rzeppa Joints. The new booklet, "The Universal Joint in Transportation" is free for the asking to motor vehicle owners who have trouble with universal joints. Send for it today.

IN response to a questionnaire sent by "Fleet Owner" to 60 fleet owners, operating 7690 units, 83% reported trouble from grease leakage; 78% reported excessive wear on vital parts; 60% replaced with new when the old joint failed; 80% WANT A BETTER TRUCK JOINT. The weighted average mileage was 53,000 miles, and average lubrication every 980 miles.

Long before this questionnaire was sent out, The Gear Grinding Machine Co. had engineered into the Rzeppa Constant Velocity Universal Joint all of the desirable features that were necessary to avoid premature trouble. Positive prevention of grease leakage was provided for. Heat treated and ground parts prevent wear. A better truck joint was built, so that when used as original equipment or as a replacement, joint troubles are solved for the life of the truck.

The bearing parts in the Rzeppa Joint cannot go dry, because the rotation of the balls feeds lubrication at all times to the contact surfaces. No possibility of sustained pressure, forcing the lubricant from bearing surfaces with resultant destruction of the joint.

The Rzeppa Joint is in use and has proved its worth in trucks, buses and trackless trolleys. It is made in two styles and various sizes—the Bell Joint with an angularity of 37½ degrees, and the Disc Joint with an angularity of 15 degrees.

THE GEAR GRINDING MACHINE COMPANY, 3707 Christopher St., Detroit, Mich.

Say "I saw it in FLEET OWNER"—It Helps!

Minimizing Monoxide in Bus and Truck Fleets

By H. Clay Fischer

Closed Windows in Truck Cabs, as Well as Bus Bodies, Present a Hazard Becoming More Common • Exhaust Gas Analysis Helpful in Minimizing It

•

ONE of the most serious problems now recognized by operators of motor trucks and buses is the constant menace of noxious exhaust fumes which contain that deadly poisonous carbon monoxide gas. The danger of carbon monoxide poisoning becomes greater as cold weather approaches and the windows in buses and truck cabs are kept closed.

As all of us know, every truck, bus or automobile engine emits fumes through the exhaust pipe which contain a mixture of various gases, the most harmful of which is carbon monoxide. When it is realized that only 15 parts of carbon monoxide, in 10,000 parts of air, if breathed for one hour is sufficient to kill a man, it is easy to visualize the great menace to life and property that carbon monoxide presents.

What this subject means to the fleet operator can probably be best emphasized by calling attention to the many newspaper reports of deaths and illness being traceable to carbon monoxide poisoning *in vehicles on the road.* For instance, from a borough newspaper in Greater New York comes the following very pertinent abstract:

"Carbon monoxide has long been the bane of passengers who use the buses of the —— Bus Corporation in ——. Exhaust fumes have been noticeable in buses of the various lines in spite of the company's contention that they are being eliminated through rebuilding of the buses and repairs to the motors. Yesterday, however, a month after the company's certificate of convenience and necessity had been reinstated by the State Transit Commission, a bus driver on that line was overcome by the fumes to such an extent that he is now in the hospital, recovering from the effects of carbon monoxide poisoning. It seems he was piloting an empty bus at about 6 o'clock in the evening when he suddenly began to feel himself lose consciousness, police report. He managed to pull over to the side of the road and was found slumped over the wheel by a passing motorist. An ambulance took the stricken driver to the hospital."

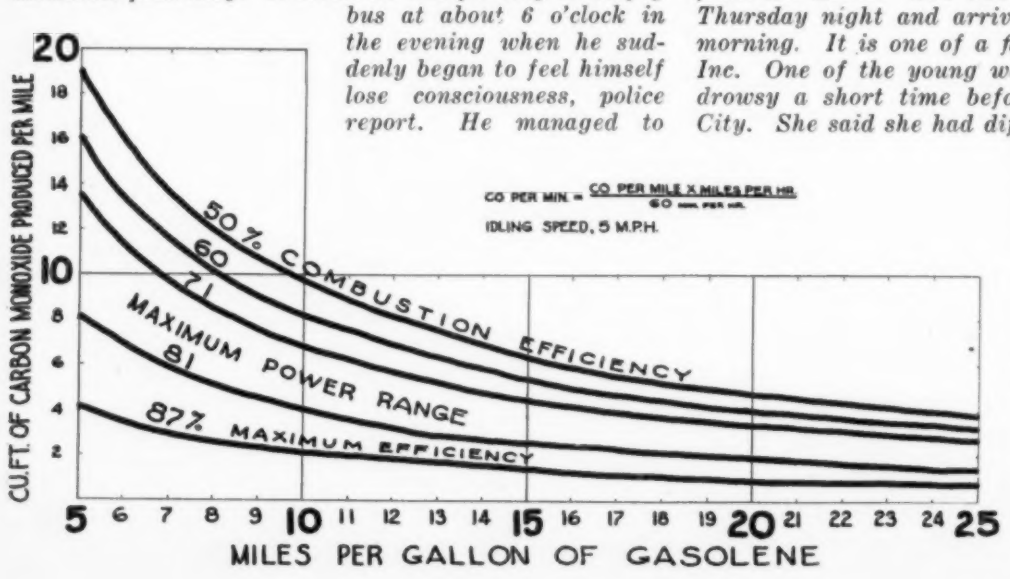
This is but one of the hundreds of stories that are appearing in the daily press. It can be readily seen that had the driver lost consciousness more suddenly, the bus might have crashed; had he failed to turn off the ignition when he did, fatal results might have occurred. We quote from another newspaper report, also in a borough of Greater New York, but not the same one:

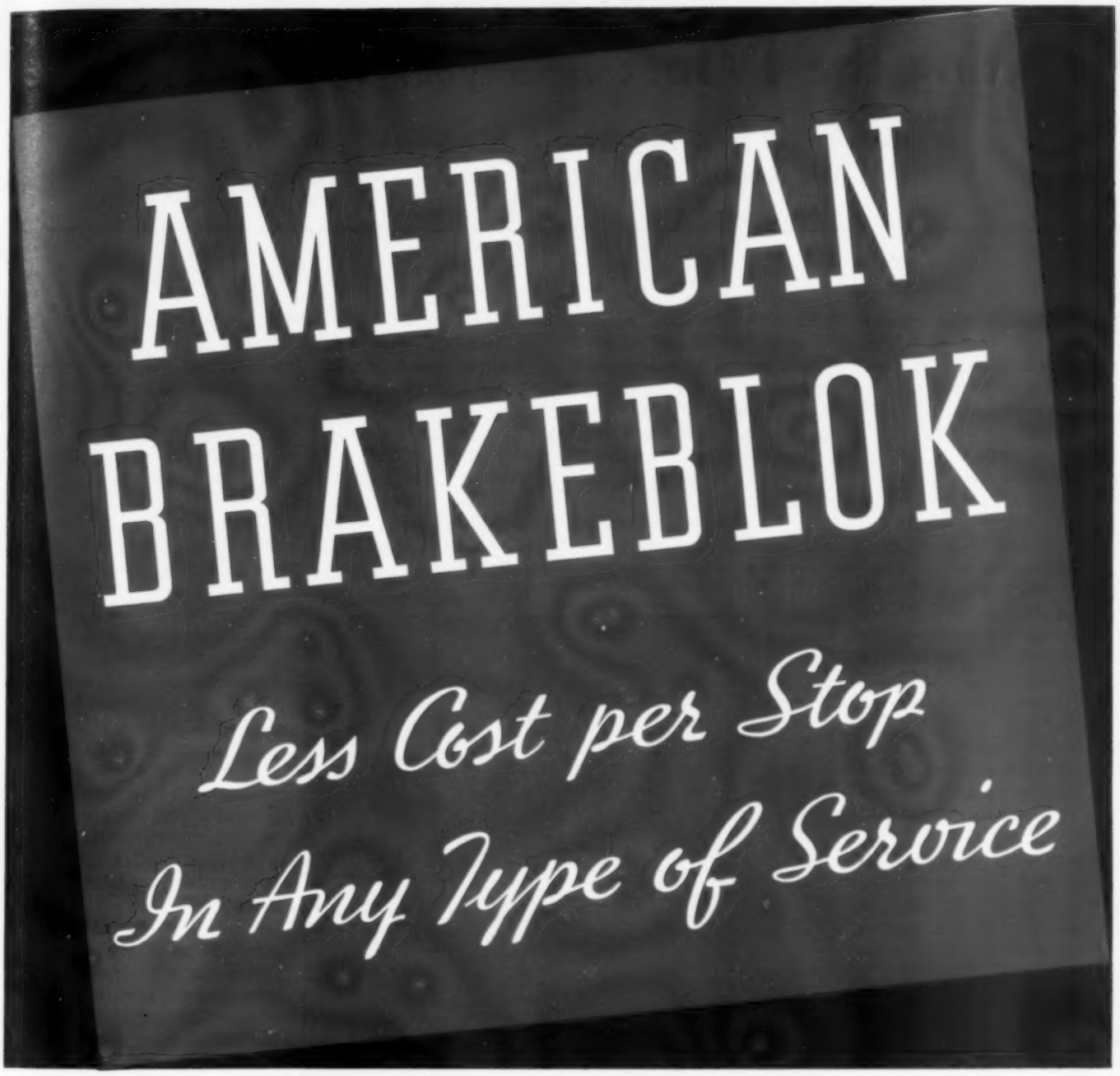
"The double-decked —— buses will be retired from service as quickly as possible and will be replaced by single-deck vehicles, it was announced today. This move on the part of the ———— Company, it is expected, will go far to eliminate some of the obnoxious fumes and gases that have long been a cause of complaint by bus riders. Many methods of eliminating the fumes had been tried, but none was a complete success. Following many complaints from passengers and civic organizations in 1930, special apparatus was installed which resulted in almost complete elimination of fumes from the single-decked buses and a decided lessening of the gases in the double-decked vehicles. Experiments along these lines were continud and last month it was definitely stated that gas fume eliminators would be placed on several of the vehicles."

And let us quote one more instance in which, according to a Kansas City newspaper report, three young women were overcome by monoxide fumes in a bus trip from St. Louis to Kansas City: It reads:

"Three young women were overcome by carbon monoxide gas fumes and four others suffered headaches and dizziness in a motor bus which arrived here Friday from St. Louis. The bus left St. Louis at 11 o'clock Thursday night and arrived here at 8 o'clock Friday morning. It is one of a fleet operated by ————, Inc. One of the young women said she began to feel drowsy a short time before the bus reached Kansas City. She said she had difficulty in keeping awake and had noticed several of the other girls' heads were nodding also and wondered if they were ill. When she reached her destination and went to the door and breathed fresh air, she fainted and was taken to a physician and then to a hospital, where her ailment was diagnosed as carbon monoxide poisoning and treated accordingly. Of the other young women affected, two more went to

(Continued on page 42)





Economy in maintenance, greater efficiency and satisfaction in performance . . American Brakeblok offers the maximum in these essential qualities for severe heavy-duty service. And it gives the same results in *any* service—truck, bus or passenger car.

• • •

ALTHOUGH American Brakeblok is utterly different from other brake linings, it is installed as a replacement without change in method or in the original brakes. This material is a dense, homogeneous solid—non-compressible in service and does not swell or burn.

American Brakeblok's alloy-grid back or mesh back adds greatly to the life of the material and makes for a security of anchorage that results in speedy, precise installations.

Any fleet owner can reduce brake maintenance costs and assure quick, safe stops by standardizing on American Brakeblok for all equipment.

Write for complete information on any type installation.

Quick Facts About American Brakeblok

This new type of braking material is:

—a dense, homogeneous solid—the same clear through.

—formed under pressure—not woven or laminated.

—scientifically heat-treated.

—ground to absolute uniformity in thickness.

—resistant to highest braking heats.

—non-compressible under braking pressures—stays in adjustment longer, minimizing possibility of squeals.

—made with an alloy backing that gives greater thickness of usable material—longer life—and better installations.

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New York, Cleveland, Chicago, St. Louis, Los Angeles, San Francisco

A Division of **American Brake Shoe and Foundry Company**

Getting the Most from your Anti-Freeze

Whatever Else You Do, Give It a "Break" By Starting This Season With Clean Cooling Systems

TRUCK and bus operators have, of course, many problems, few of which are more irritating or expensive than those which center on the cooling systems of the units under their supervision. Steaming radiators, frequent oil replacements, lay-up periods and lost operating hours add up too quickly and show too prominently in the red to be considered with equanimity. Nevertheless, the total time-out because of cooling system trouble continues to mount.

With the Winter well upon us, it will be probably worth while to give more than ordinary thought to the cooling system. The facts contained in the following paragraphs, while not new ones, are worth repeating, we believe, for the benefit of those with good intentions but delayed occupations.

While the truck cooling system of today is a considerable improvement over the system of a few years ago, the operator must still do his part. The cooling system requires maintenance just like any other part of the truck. Neglect in this department means a higher average per mile haulage cost.

At one time it was almost impossible to keep a truck cooling system clean and tight, but most operators were not duly agitated.

The general practice seems to have been to drive a radiator until it became clogged or broken beyond repair, then junk it in favor of a new one. An absurd and expensive procedure in view of the equipment which has now been developed and with which most radiators can be repaired, cleaned and prepared for service in a very short time and at a comparatively small expense.

Regardless of the make or type of anti-freeze you have chosen, the best results can not be expected if cooling systems have been neglected. Good anti-freezes now prevent corrosion, but they will not remove a summer's accumulation of rust, sludge, grease and slime. You must do that and the article tells how, briefly and to-the-point.

An operator doesn't drive a truck until the valves burn off, nor does he neglect the oil until the motor sticks.

So it should be with the cooling system. Rubber hose is comparatively short lived in trucking service; high speed water pumps wear packings; road shocks, strain and driving vibrations break radiators; gaskets have a curtailed period of efficiency and water passages accumulate rust and scale which reduce cooling efficiency. Failures in these parts cause loss of solution which, in turn, results in overheated engines, deteriorated lubricating oils, loss of power, possibly expensive hang-ups and most certainly a generally less efficient powerplant.

It is neither difficult, time-consuming nor expensive to clean a truck cooling system. All the equipment required is a combined air and water nozzle, a water hose, an air line and a supply of a standard cleaning compound or an alkali such as washing soda. Cleaning procedure is as follows:

Open the lower hose connection and the drain cock. This insures rapid and complete drainage. Connect the opened hose and close the drain cock. Place the cleaning compound in the system according to directions given on the container. If soda is used, mix ½ lb. to each gallon of water and use about three quarts of kerosene oil, placing the oil in the cooling system before the cleaning solution is poured in. Use enough solution to fill the radiator.

Start the engine and with a cover over the radiator to cut off air, run at a medium speed until hot, about 180 deg. Continue for between 20 and 30 min. Stop engine.

Disconnect lower hose connection and drain as done originally. Place the air and water nozzle in the opened hose connection and flush the system in a direction opposite to normal flow. Care should be taken not to build up too high an air pressure in the cooling system or a burst radiator may result. The air jack should be applied to the valve on the nozzle only for a few seconds at a time, just long enough to impulse the water stream.

About 10 min. of this will usually clean out the greater portion of the rust, sediment and scale and leave the cooling system clean, as will be indicated by the clearness of the exhaust stream.

And now you are ready for the anti-freeze, provided you operate in temperatures below freezing. (Don't tell us that you idle the motors and don't need anti-freeze. It's far cheaper to use it.) If you have not as yet made your committments for this season, our best advise to you is to make some jobber's salesman happy. Your local source of supply, as always, you'll find on the job with a reliable make of anti-freeze. We've done our part; now you do yours.

...a Course *in* Automotive Ignition

By M. Mallory

• ARTICLE XXV •

IN this, the twenty-fifth lesson of the Mallory Ignition Course, we shall discuss the various methods used for causing the spark to be retarded, to effect a smooth engine idle when the throttle is closed, and to *immediately* advance the spark to effect a good pick-up when the throttle is opened. The new methods used, as explained herein, are designed by the writer. (Editor's Note: The first twenty-four lessons of this course have appeared in previous issues of this publication).

In many engines it is necessary for the spark to be advanced from 5 degrees to 15 degrees *before* dead center to effect a good pick-up, and to be retarded from 5 degrees to 10 degrees *after* dead center to effect a smooth idle. The result is that when the timing is set for a good pick-up, the engine will not always idle smoothly.

To make this clear in your mind, refer to the chart, Figure 1, on this page. Assuming that the engine required a total advance of 35 degrees, as indicated by the advance curve, and that the spark must occur 10 degrees *after* dead center in order that the engine will idle smoothly, and 10 degrees *before* dead center to effect a good pick-up, and be advanced 35 degrees at 2,600 revolutions per minute of the engine, it will be seen that the spark must be advanced 20 degrees on the engine just as soon as the throttle is touched, in order to effect a good pick-up. This is indicated by the broken line on the chart, Figure 1.

Inasmuch as there is no change in the engine revolutions per minute at the instant the throttle is touched, it is therefore impossible for a centrifugally-controlled ignition governor to act quickly enough to advance the spark the necessary 20 degrees immediately, by merely "cracking" the throttle.

The following are several new methods conceived and used by the writer, to cause the spark to occur

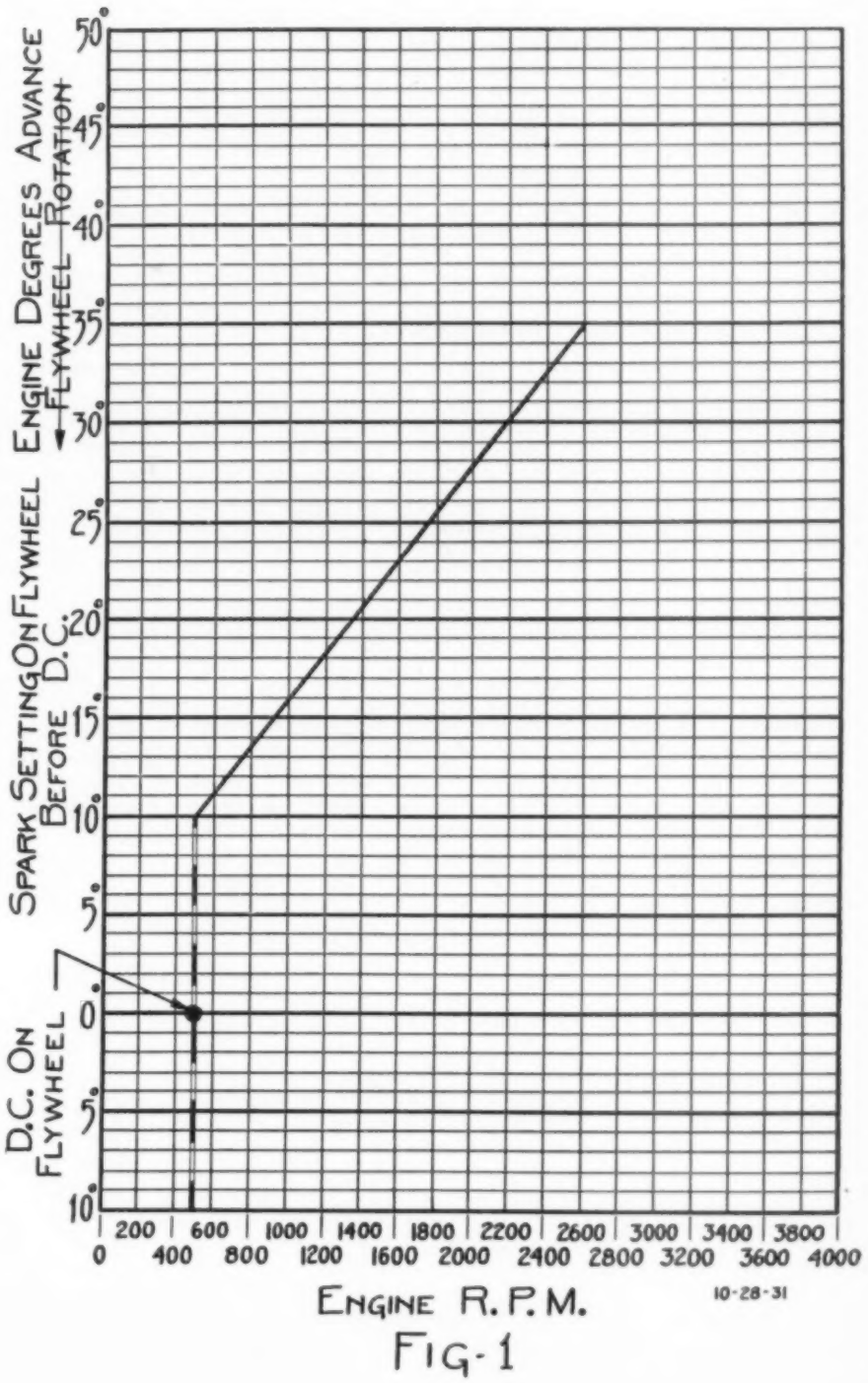

FIG-1

A COURSE *in* AUTOMOTIVE IGNITION *(Continued)*

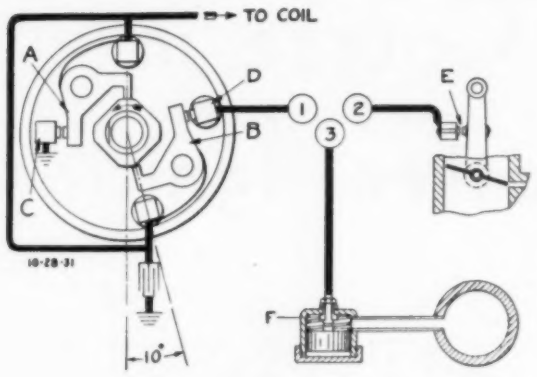

FIG-2

after dead center when the throttle is closed, and to cause the spark to occur *before* dead center the moment the throttle is moved from its closed position.

The reader is now referred to Figure 2. The circuit-breaker (B) is located so that it opens 10 degrees later than the circuit-breaker (A). As the timer or distributor shaft speed is one-half engine speed, this would mean 20 degrees on the flywheel. The contact post (C) is grounded, and the contact post (D) is insulated. If

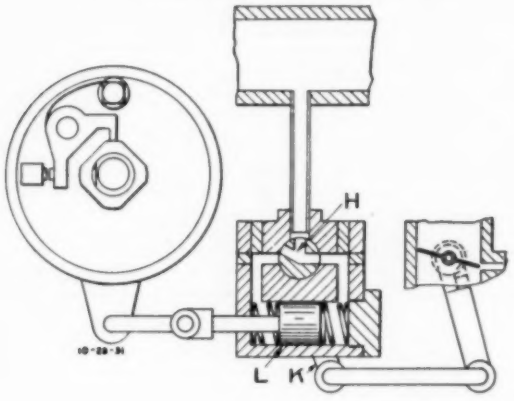

FIG-3

the wire (1), leading from the contact (D), were connected to the wire (2), the contact (D) would be grounded by the throttle-stop or contacts (E) when the throttle was closed. The circuit-breaker (B) now does the timing of the engine, but, as quickly as the throttle is "cracked", the circuit is opened by the contacts (E), and the circuit-breaker (A) does the timing. Consequently, the spark would be advanced 20 degrees on the fly-wheel by merely touching the throttle, if a

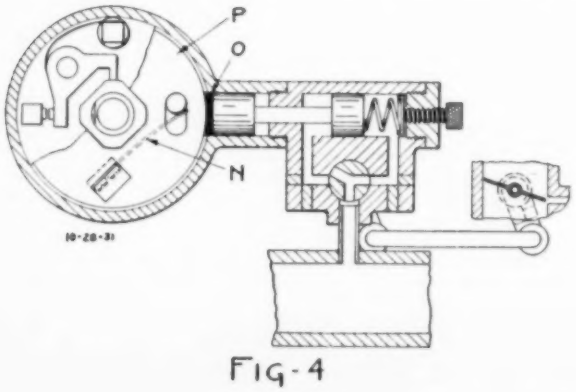

FIG-4

hook-up such as is shown in Figure 2 were used.

The reason that the circuit-breaker (A) does not do the timing when the circuit is closed through circuit-breaker (B) is because the circuit-breaker (B) is always in a closed position when the circuit-breaker (A) opens. Consequently, the circuit-breaker (A) cannot cause a spark to occur when it opens.

If it is not desired to operate this circuit by the throttle, a vacuum switch can be used, as indicated at (F). Terminal (1) will then be connected to terminal (3). Due to the fact that the vacuum in the intake manifold is always the highest when the engine is idling, the vacuum switch will always be closed, and, as soon as the throttle is "cracked," the vacuum switch breaks the circuit. Consequently, the result would be

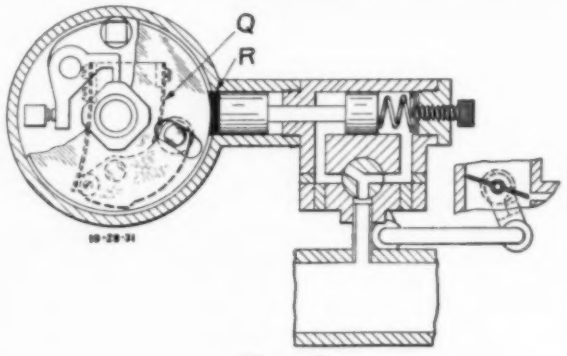

FIG-5

the same as if the circuit were broken by the throttle stop.

The construction of the device, shown in Fig. 2, is preferable because it is simple. However, other constructions may be used. For example: Both contact posts (B) and (C) could be insulated and a two-way

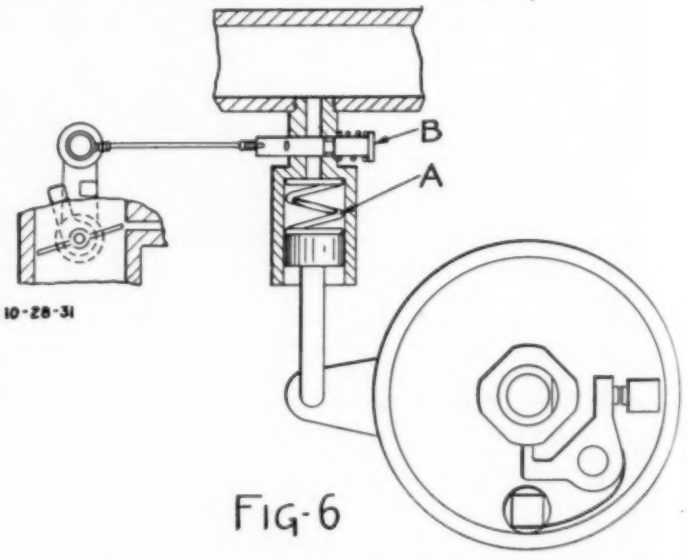

FIG-6

switch used, so that one contact would be in the circuit when the engine is idling, and the other contact in the circuit when the throttle is opened.

Another method that can be used to obtain practically the same result is shown in Fig. 3. When the engine is idling, the valve (H), which is connected to the throttle by lever (K), is in a position so that the vacuum will effect a pull on one side of the piston (L) to retard the spark, and, as soon as the throttle is

(Please turn to page 44)

JOHN LAW SEZ:

(Recent Court Decisions as Reported by National Highway Users Conference)

CALIFORNIA

Casual Inspection Insufficient

IN an action brought by a passenger against a common carrier stage to recover damages for personal injury sustained when the bus suddenly veered off of the highway into a ditch, the court held that the evidence was not sufficient to sustain defendant's contention that the accident was due to a latent defect where the plaintiff relied upon the doctrine of *res ipsa loquiter* and where the accident was caused by a blow-out, presumably the result of a defective rim and where defendant's sole testimony was that an employee gauged the air in the tires and looked at the rims but did not sound out or remove the rims to see if there were defects.—*Wendler v. Pickwick Stages System, Ct. of App., Third Dis., 24 P. (2d) 543.*

●

DISTRICT OF COLUMBIA

Taxicab Associations Regulated

ASSOCIATIONS of at least 20 owners shall file certificate of identity giving name and address for service of process, copies of articles of association, statement of assets, description of vehicles used, rates of fare, cab color scheme, etc. In Re: Regulations governing the operation of passenger vehicles for hire having a seating capacity of less than eight passengers.—*P. U. C. No. 2942/29. Order No. 1187. Sept. 11, 1933.*

●

INDIANA

Injunction Restraining Competition

THE circuit court's granting of an injunction to an operator of motor vehicles holding a certificate of convenience and necessity against other persons allegedly conspiring to injure his business by operating illegally in the territory served by the certificate holder was upheld by the appellate court, notwithstanding the matter had not been submitted to and finally adjudicated by the Public Service Commission. The court holds that the Public Service Commission is an administrative body having exclusive jurisdiction in matters which are purely administrative. In this instance the Public Service Commission would have been required to have prayed an injunction in the courts to restrain violation of an order which it might have issued against the so-called conspiring competitor. The court further holds that the right to pray for an injunction is not limited to the Commission but is expressly given to any person having a special interest in the enforcement of an order.—*Warehouse Distributing Corporation et al. v. Dixon, App. Ct. of Ind. in Banc. 187 N. E. 217.*

●

IOWA

One-Way Trips—Ton-Mile Tax

"IT appears," the Commission stated, "he proposed a one-way operation in order to avoid payment of the ton-mile tax on the return trip." The Commission has heretofore gone on record as being opposed to the establishment of additional one-way freight motor carrier lines. The application was denied. In Re: Application of Orval W. Bullock to Operate as a Motor Carrier of Freight One-Way from Sioux City to Anthon.—*Bd. of Railroad Commissioners, Docket No. H-1884, Oct. 25, 1933.*

●

LOUISIANA

Municipality Subject to Gas Tax

THE court holds that municipalities are not exempted from the gasoline tax. To permit municipalities to escape payments of the tax by purchase of gasoline outside of the state would deprive local dealers of their reasonable and legitimate profit and that, "This would indeed amount to a policy of industrial suicide for the communities adopting it and for the state; and we do not think the Legislature intended any such consequences."—*State v. City of Monroe, Sup. Ct., 149 So. 541.*

●

MAINE

Operator Defined as Contract Carrier

PERSON who transported road oil from point to point over the highways for which he received a compensation based upon gallonage and whose business was seasonal was nevertheless held to be a contract carrier and not within the exception of an operator "who does not engage regularly in the transportation business but who on occasional trips transports the property of others for hire."—*In Re: Application of the Diamond Match Co. re: Contract Carrier, Public Utilities Commission, X No. 538, Oct. 13, 1933.*

●

NEW HAMPSHIRE

Truck is "Power Driven Machine"

A MOTOR truck is a "power driven machine" within the meaning of the Workmen's Compensation Act and a truck operator may recover compensation under that law for injuries sustained.—*Plourde v. Auclair. Sup. Ct. 167 A. 275.*

●

OHIO

Independent Trucker Not Liable

WHERE person holding contract for hauling of goods for a factory-employed truckman for hauling particular loads, truckman being free after having made the trip to do as he pleased and being subjected to no more control than that he was required to pick the goods up at one place and deliver them at another, the route he took not being fixed for him nor the time except that he received a bonus of $5 if the goods were delivered within a certain time, the $5 being deducted if they were not delivered at the specified time, the trucker was held to be an independent contractor and not an employee or servant and the freight procurer was not liable under the Workmen's Compensation Law for the death of the truckman's driver.—*Fisher Body Co. v. Wade, Ct. of App. of Ohio, Huron County, 187 N. E. 78.*

●

OKLAHOMA

Not Subject to Compensation Law

A CLASS "B" motor carrier was held not to be engaged within the classification of hazardous industries and business enterprises covered by the Workmen's Compensation Law. Further, the clause "transfer and storage" does not include a transfer business unless it is operated in connection with a storage business.—*Jones and Spicer et al. v. McDonnell et al. Sup. Ct. of Okla. 23 P. (2d) 701.*

●

PENNSYLVANIA

Truck Negligently Left on Highway?

WHETHER truck which stopped on highway to aid stranded motorist and, while pulling the motorist's automobile back onto the highway, crossed the center of the highway in a diagonal position, was liable for injuries sustained by motorist approaching from opposite direction held a question of fact for the jury and was not as a matter of law in violation of statutes forbidding leaving a vehicle standing on highway unless not less than 15 feet opposite vehicle be left open.—*Henry S. Liebovitz & Sons, Inc. Sup. Ct. of Pa. 167 A. 304.*

140. **Put It's Foot Down.** That's what the legislators have done with reference to inefficient braking. January 1, 1934 is the deadline for modernizing the brakes of all trucks, trailers and buses in many localities. You can't say we haven't warned you. Interesting literature has been prepared, showing how you can do this at low cost. If you want it, Number 140 brings it free. (P.S. This particular system requires the fewest parts, costs nothing to operate and calls for a minimum of service attention, so we are told.)

•

141. **Free Decelerometer.** Sounds almost too good to be true, doesn't it? But it's not a novelty and not a toy. They call it a Stop-O-Meter and it consists of a printed card with various brake performances graduated thereon. A pendulum, attached to the card, tells the story when the brakes are applied. All you have to do is hang it on the window of the cab and make your brake test. We understand that it operates on the same principle as the most costly of decelerometers, and it's free to fleet operators who will take the trouble to put Number 141 on our coupon below. (We anticipate that there'll be many requests for this, so first come, first served.—ED.).

•

142. **Text-Book on Body Building.** Over 50 pages of practical, helpful information about aluminum truck bodies—detailed construction drawings, 17″ x 23″, printed on paper from which blue-prints can be made —are included in this new book. It also contains operating and weight-saving data on aluminum bodies now in use, including dump bodies, vans, truck tanks, etc. Also detailed information on how to design and build such bodies to obtain low weight and long life. Need we say more? Number 142 brings it. The cost? Nothing but your good-will.

•

143. **Frank Talks on Anti-Freeze.** When reading a manufacturer's advertisement, which featured the above headline, we wondered who "Frank" was, and what was his last name. We've since learned, however, that it does not refer to any individual but means that the talks they've been giving you have been plain, unvarnished facts. If you want to "drop the rose-colored glasses" and get the latest facts about this new anti-freeze before your vehicles suffer from freeze-ups, just indicate your desire by including Number 143 on the coupon. They'll tell you why their anti-freeze will be a money-saver for you this winter. And you won't be obligated, either.

•

144. **Hands Off!** A good sign to have hanging around your own personal tool box, a freshly painted vehicle or your best girl. Now they say that you can adopt a "hands off" policy when charging batteries, inasmuch as you can charge them without touching them—without removing floor-boards—and without fussing with battery connections. Number 144 brings free literature covering new battery chargers that employ no bulbs and require no replacements and that are said to operate 7 to 9 years without renewals. It's now your move.

WHAT DO YOU READ?

HERE'S a hand-picked assortment of literature that is offered to you entirely without obligation.

We've even made it easy for you to get it. Fill in the coupon below, mail to the Editor, and let us do the work. We'll ask them to send it at once and not to bother you with salesmen, either.

145. **One-two-three-four-five-six-seven-eight-nine-ten.** It's not sheep that we're counting, but ten new ways of getting more work out of your motor trucks. In fact, put quotations around it. and you'll have the name of an interesting booklet that gives the here's-how. The answer is by means of the modern truck time-clock, that enables each truck to keep its own record automatically. You can save truck time. prevent wasted time and get fair and square deals from your drivers by this method. Number 145 brings complete literature without obligation.

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146. **Are You Prepared?** With winter not right around the corner, but here, it would be well to anticipate radiator requirements. Not that we think you'll try to beat the anti-freeze people, and idle your motors, but it is possible that you may need new cores and need them in a hurry. A catalog covering replacement radiators won't take up much room in your file and we'll see that you get one without obligation. All you have to do is include Number 146 on your coupon.

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147. **Transport Enamels.** A clever way of saying that this type of paint will look well on your trucks as well as on your buses, if you have any. The thing to remember is that this new type of finish has been developed especially for fleet use. All those qualities you've been looking for have been included, they tell us, and we're here simply to put you in touch with the manufacturer. Number 147 brings the complete story, sans cost, obligation or salesmen.

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148. **Weld It or Rivet It?** You can do both to aluminum, and know that you are doing it properly, if you possess these two books on the subject. One is called "The Riveting of Aluminum." The other, "The Welding of Aluminum." All of the old bugaboos have been ironed out and you'll find these two books surprisingly free from high-hat, technical details and comprehensively to-the-point. Although they cost a pretty penny to produce, they're free for the asking. We think sufficient of them to include them in this department. You'll think as much of them when you get them, and, believe us, we've placed our copies where no one can walk off with them. Number 148 brings them, free, gratis or for nothing, if you will.

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149. **What Does It Cost?** Figures on truck costs, although they usually do not mean a thing except to the particular operator concerned, are always interesting. We have a piece of literature that is *actually* the cost record of a successful transportation system. using 71 heavy-duty tractor-semi-trailer units. Almost 4,000,000 miles' experience are included in the report. If you would like to get it, and see how they operated at a total operating cost of .0592 per mile, Number 149 on our coupon below brings a free copy.

The Editor, FLEET OWNER, ...1933
90 West St., New York, N. Y.

Kindly send me without obligation, the following free books mentioned in the ..... issue. (Literature will not be sent unless firm name is given.) Order by number.

....

....

Firm Name .....

Address .....

City and State .....

Your Name .....Position .....

as WE GO to PRESS

(News from the Manufacturers)

ORDERS for more than 125 of the new truck models recently introduced in the $1,000 price field, have been received by the White Company up to the time of our going to press, according to A. G. Bean, president. "These new trucks were introduced at a new low price to reach a market of more than 100,000 buyers who need new trucks at this time," he said. "From the orders and inquiries we are receiving from all sections of the country, we are confident that replacement buying is now under way and that business in general is preparing for a steady improvement," he added.

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DESCRIBING its action as the direct answer to a growing economic demand, the Brockway Motor Company announces its entry into the field of electric truck production with three models, said to be interchangeable in parts with corresponding series in the Company's gasoline trucks. There is a short job particularly adapted to frequent stop delivery service; a larger one that will handle from 2 to 3 tons; and a heavy-duty model for loads ranging from 3 to 6 tons. Speeds range from 14 to 18 m.p.h. Details will be sent on request. Address Brockway Motor Co., Inc., 631 W. 46th St., New York City.

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THE Toledo Steel Products Company, manufacturers of Toledo valves, valve guides, chassis bolts and bushings and water pump parts, has introduced two new steering knuckle bolt and bushing sets. The Toledo King Bolt Set, K-5, services all Model B and V-8 Fords. The Toledo King Bolt Set, K-6, fits Chryslers, DeSotos, Dodges, Plymouths, Dodge and Fargo Trucks. Each set is a complete unit, permitting the fleet mechanic to do the entire job. Each is packed in a strong durable carton. Complete specifications may be secured on application to The Toledo Steel Products Company, Toledo, Ohio.

•

EFFECTIVE last month, Reo announced new low prices on its 1½ to 2½ and 2 to 3-ton Speed Wagon models. Prices of the entire Reo line now range from $595 to $2595 and upwards. All Reo trucks are now powered with Reo-built Gold Crown engines, ranging from the 230 cu. in. six to the 358 cu. in. eight and all major units are built in the Reo factory, the announcement points out.

AN automobile storage battery of distinctive and new design is announced by B. F. Goodrich Company, Akron, Ohio. Manufactured in all sizes for all popular makes of cars and trucks, the battery unit is entirely encased in a hard rubber protective cover of modernistic design. All of the exposed metal parts of the battery are completely covered, the exclusive new cover protecting against dirt, acid fumes, surface moisture and metal shorts, caused by accidentally dropping things across the terminals. When water is needed it can be added without removing the cover. Full details on request.

•

THE Bates-Ludington Company, Ludington, Mich., has been organized to manufacture replacement parts for popular cars and trucks. Ralph E. Bates, well-known in the parts field is President. A new plant is announced, "filled with new machinery of the most modern and efficient production type, to produce at low cost, parts that in themselves are the expression of a new idea" is quoted from the initial announcement. Deliveries will start early in 1934. The line will include cylinder heads, manifolds, clutches, flywheel and transmission housings, etc.

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THE first of a new type of small bus, produced by the Bill Motors Company, Oakland, Calif., has been delivered to the North Sacramento Bus Company, No. Sacramento, Calif. The bus is of the street-car type, with side-door, seating 20 passengers. It is constructed around the Curtis-Bill front-drive unit, powered with a Lycoming eight and featuring lightness of construction without the sacrifice of strength. Details will be sent by the manufacturer, on request.

•

SIX different generators to meet all operating requirements have been developed by Delco-Remy engineers in conjunction with Chevrolet, which will be furnished on order to fit Chevrolet Master and Standard cars and trucks. These special generators will take care of such requirements as police radio, high speed trucking, door-to-door deliveries and bus work. They will fit the respective cars for which they are designed and are supplied with all necessary attaching parts. Write to Chevrolet Motor Company at Detroit if you are interested.

ANNOUNCEMENT is made of the appointment of W. H. (Cap) Edwards, veteran manufacturer, as general manager of all Studebaker truck activities. The truck division will operate as a separate unit and C. H. Wondries will continue in charge of sales in that division. J. L. Engels, director of sales promotion and truck advertising since 1925, will also continue in that capacity. A program of expansion in this branch of Studebaker's business during 1934 is also announced.

•

THE directors of Packard Electric Corporation, Warren, Ohio, announce the appointment of B. N. MacGregor as vice-president and general manager, effective November 1st, 1933. Mr. MacGregor is well known throughout the automotive industry and has been with the Packard organization for 14 years. He has been active in association work in the old A.E.A., the N.S.P.A. and other similar organizations. Congratulations, Mr. MacGregor!

•

A NEW, patented fluid cut-off valve, for use with DeVilbiss spray guns, has been developed by The DeVilbiss Company, Toledo, Ohio, manufacturers of spray-painting equipment. This improvement permits the operator to drain the gun of fluid, or to blow out any obstruction in the fluid tip, without disconnecting the gun from the hose. Hence it increases production speed. Complete details will be sent on request.

•

APPOINTMENT of N. K. Haig to the newly created post of managing director of Government sales for the Chevrolet Motor Company is announced by the Company. The new office involves supervision of all passenger and commercial car fleet sales to private individuals and firms, as well as fleet deals with federal, state, city and other governmental agencies.

•

SHIPMENTS of Reos for the month of October were twice as great as they were in October of 1932, according to R. H. Scott, president and general manager of the Reo Motor Car Company, Lansing, Mich. "For four consecutive months Reo business has shown steady improvement, both in the passenger car and truck lines," he said.

TROUBLE SHOOTER

(You Ask 'Em — We Answer 'Em)

A department, devoted to correspondence from readers of FLEET OWNER. Any questions having to do with automotive service will be answered in this department. All properly signed inquiries will be replied to by mail and such of them as are believed to be of possible interest to other readers will be published in these columns.

Be Sure It's Lubricating Graphite

Question: In our fleet of trucks some of the drivers prefer the graphite type of grease for lubricating the chassis. We are wondering if this type of grease is all right to use, or if it would have a wearing quality that graphite is known to have? Is it O. K. to use graphite grease in bronze cap, babbitt and roller bearings? We are also desirous of using it in a shovel where there are large bronze and babbitt plain bearings. In both trucks and shovels it seems to run cooler than regular pressure grease, but we would like to have the assurance that it is perfectly safe as a lubricant.—D. L. P., Baraboo, Wis.

Answer: So far as we know, graphite greases are all right, providing they are *lubricating* graphites, made especially for this purpose by reputable manufacturers. There are various forms of graphite, some of which are even abrasive in action, but you will be safe if you choose those that are especially prepared for automotive use.

There are several types of graphite lubricants. That kind which has the consistency of Number 3 cup grease is recommended by one manufacturer for chassis bearings, grease cups in general, wheel bearings, etc. Then there is a heavier grade, similar in body to Number 5 cup grease, that is intended for external gears, exposed bearings, chains, etc. There is also a special graphite gear case lubricant, a graphite water-pump grease, extreme-pressure graphite lubricant and even, we believe, a special graphite universal joint grease.

It is not our purpose to recommend graphite grease as superior to anything else; we are simply pointing out the fact that these various graphite greases exist, and, so far as we know, they are being sold to and used by fleet operators for automotive work. The thing to remember is to pick a *lubricating* graphite, if you are inclined to prefer graphite grease, and the easiest way to be sure is to choose the product of a reputable manufacturer.

More recently, a new form of graphite lubricant has appeared, known as "colloidal graphite." This, we understand, is a very highly refined product, intended to be used as a lubricant and to be deposited initially in the form of a film on bearing surfaces, somewhat permanent in effect. We'll get more dope on this type of lubricant if you, or any of our readers want it.

●

Many Operators Have Sent for It

Question: We have been reading your publication for some time. Would appreciate your advice as to whether you have some inexpensive book or form on which truck maintenance expense may be recorded.—F. B. R., St. Charles, Mo.

Answer: There are many such systems in existence and we are sending you the names of the producers under separate cover. Recently a 52-page book entitled *"Operating Record for Motor Trucks and Buses"* has been prepared by Dodge Brothers Corporation. We understand that The White Company also issues one of these and it is possible that other truck manufacturers do, also. Why not drop a line to some of these companies? If you mention this publication and indicate the size of your fleet. we feel certain they will be glad to send you whatever they have.

(ED. NOTE: *The book illustrated on page 26 of our October issue is one of the above. Many operators have written to us for it and there are still some copies left. If you'd like a free copy, drop us a line.—H. C. F.*).

●

When the Bendix Drive Sticks—

WHILE a properly installed and well-lined-up starter drive should give no trouble, yet there are cases where a seemingly perfect job will jam up now and then. On a passenger car this presents a simple problem—just slip into high and rock the car back and forth. But rocking a heavily loaded truck or bus is out of the question. Where the flywheel housing is equipped with a peep-hole or inspection plate (such as on Reo engines) it is a simple matter to stick a heavy screw-driver or tire iron between the flywheel teeth (through the inspection hole) and use it as a lever to move the flywheel in the opposite direction. This will usually do the trick promptly.

You May Not Believe It!

(But It's True)

THE FACT:

A LEAKY air-line is more costly than a leaky steam, water or gas line. This fact is computed on the basis of working pressures as follows: 100 lb. per sq. in. for air and steam; 40 lbs. for water; and a four-inch water column pressure for gas.

EXPLANATION:

IT IS, of course, the high pressure that makes the air leak more costly. A 1/16-inch hole, for instance, in an air line will waste 278,700 cubic feet of air in a month at an approximate cost of $28.20. During the same period, the same size leak wastes 13,000 pounds of steam, worth about $13.00; or 19,500 gallons of water, costing about $1.85; or 2,210 cubic feet of gas, costing about $1.10.

The above figures are arrived at with air costing 10c per 1,000 cubic feet, and the gas 50c per 1,000. Because of the high pressure maintained in the air lines, this small leak permits the escape of a correspondingly greater quantity of air. (This example was worked out in the Graham factories in Detroit, to whom we are indebted for this curious fact.—Ed.)

TROUBLE SHOOTERS' DEPARTMENT (*Continued*)

What Is the Life of Solid Tires?

Question: Is there any way of determining just when solid truck tires should be replaced? I am operating a number of trucks on solids and although they are worn down to about 1½ inches from the steel rim, they seem to be as good as ever. Is this enough cushioning or should they be replaced before they wear down this much?—C. L., St. Louis, Mo.

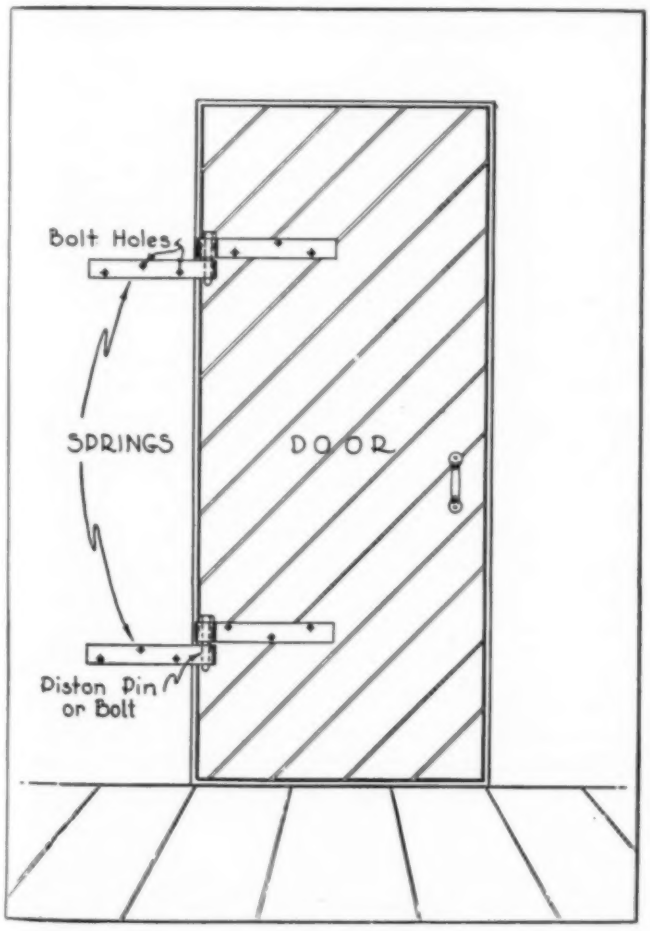
Answer: It is our opinion that solid tires can be operated efficiently until they are worn down to about 1 inch outside of the steel rim. It seems that there is sufficient rubber counter-sunk inside of the steel rim to provide the necessary resiliency.

This information applies to solid tires of any size and to solid tires of the cushion type as well. You are perfectly safe in operating your trucks on tires with 1½ inches of rubber and they can be even run until they wear down to 1 inch as outlined above.

●

A New Use for Old Auto Springs

AUTOMOBILE repair shops wishing to put every possible bit of scrap material to some use in their shop can find an interesting outlet for broken automobile main spring leaves and old or worn piston pins in the making of hinges for heavy doors.



The ends of the main spring through which the shackle bolt fits can be cut off to the correct length for the hinge with the oxy-acetylene cutting blowpipe. The necessary number of holes for screws or bolts can then also be cut through the spring with the cutting flame and, by arranging the sections as shown in the sketch, large hinges for heavy doors such as those used in shops and sheds are quickly and easily made. The piston pin is used as the hinge pin, or any ordinary bolt.—*Suggested by Linde Air Products Co., New York, N. Y.*

●

How to Align a Ford's Wheels

Question: How much backward tilt should a front axle have on the Ford Model AA truck? What is the caster and other wheel alignment specifications?—R. M., Youngstown, Ohio.

Answer: We are pleased to give you the following specifications applying to the Ford trucks, model AA:

Pitch of Wheels 1″
Toe-in of Wheels 1/32″
Axle Caster 1 degree
King Pin Angle 7 degrees

This information appears in a popular Wheel and Axle Manual, a copy of which we are sending you under separate cover, with the compliments of the publishers.

●

Again, that Knock on a Turn

Question: We are having trouble with a 1927 Dodge truck. In going around a turn it develops a noise in the motor, which occurs on a turn such as a traffic circle, at a speed of about 25 m.p.h. This noise stays in the motor until we straighten the wheels out, when it will disappear without changing the speed of the truck. It sounds like a very heavy piston slap. We have recently overhauled this motor and have every reason to believe that it is no normal knock.—G. C., E. Paterson, N. J.

Answer: Your noise is probably caused by a loose motor support bolt, either at the front or rear. You might check this up carefully. It is also possible that in turning a corner, the oil in the crankcase is thrown to one side, leaving the oil pump dry for a few seconds. This would cause the bearings to knock on account of lack of oil, just as they would if you tried to run the motor after draining the crankcase.

The latter suggestion is purely theoretical, of course, inasmuch as we are not sure of the construction of your oil-pan and the location of your oil pump. You might try putting a few extra quarts of oil in the crankcase, as an experiment, to see if this eliminates the knock. If so, you might be able to solder a sheet-metal baffle around the oil pump to take care of this condition.

●

Rail-Bus Uses Automotive Units

DESIGNED by the Four Wheel Drive Company, Clintonville, Wis., the FWD rail bus has been recently introduced. It is 30 ft. long, 7 ft. 7 in. wide and has accommodations for 35 passengers as a standard day coach. It is driven by two 86 h.p. motors and can attain a speed of 70 m.p.h. or more. Each axle (front and rear) is driven by a separate motor, through a separate 3-speed transmission. Controls are synchronized, of course, through a single set of levers in the operator's compartment. Either drive unit can be shifted into neutral. Axles, each having one wheel at each end, are of the full-floating, automotive type, with conventional differentials.

QUESTION *of the* MONTH

"By far, one of the most valuable departments to be found in any automotive publication. Every fleet man should be delighted to cooperate."—A Reader

Here are Some of the Most Interesting Replies to Question No. 37:

"Welding Equipment Most Valuable of All"

"WE consider our welding equipment the most valuable part of our shop equipment, as we are able to effect large savings through the use of it. All welding, of course, is done in our own shops.

"Our welding equipment consists of a welding torch, cutting attachment, separate cutting torch, lead burning torch and an electric welding set. Carbon is scraped out, but we use the welding equipment for many jobs.

"Bronze-welding is used for building up such worn parts as grader castings, bearings, pulleys, shafts, axles, etc. We have been doing this reclaiming work for five years and find it satisfactory.

"We have also been doing some hard-facing of parts and this, too, we find to be satisfactory. Other parts that we repair by welding include cracked castings on graders and crushers, cylinder blocks, motor bases, etc. We find many uses for the welding torch around the shop, such as freeing-up frozen nuts, press fits, etc., various cutting jobs, pipe-line work, etc.

"Copper-coated iron rod is used for general welding; steel rod for building up shafts of alloy steel; steel electrodes for all electric welding work; bronze rod for castings, building up worn parts, etc.; and aluminum rod for motor bases, pans, transmission covers and all aluminum parts."—*Chas. Hudson, Foreman, State Highway Garage, Knoxville, Tenn., operating a fleet of 210 trucks, 85 passenger cars and 172 other pieces of automotive equipment.*

●

Another Interesting Bit of Experience

"ELECTRIC welding only is farmed out to other shops; all other welding is done by ourselves. We scrape out our carbon and really have very little trouble on that score.

"We are equipped with a heavy welding torch with cutting attachment. We have been reclaiming many parts by bronze-surfacing and subsequent machining, such as universal joints, sleeves, housings, brake cam shafts, etc. Been doing this for several years; also the hard-facing of parts, with good results.

"Other bronze-welding reclaiming includes cylinder blocks, cylinder heads, frames, fenders, body parts, etc. This type of repair is very satisfactory. As to the use of welding rod, we use very little of the copper-coated iron variety. We use steel rod on all steel and alloys; very little cast iron rod; bronze rod is used for cast and malleable iron jobs and works well. Some aluminum rod is used for repairs to that particular metal. We use mostly steel high test rod, bronze rod and aluminum rod, in the order named.

"Our work consumes about 400 cu. ft. of oxygen per month, and about 300 cu. ft. of acetylene; also about 20 lbs. of welding rod. This material is obtained both from gas manufacturers and jobbers."—*R. F. Hardin, Foreman, Kroger Grocery & Baking Co., Kansas City, Kans., operating a fleet of 9 trucks and 8 trailers.*

●

"Bronze-Welding Nice Job on Water Pumps"

"ALL our welding is done in our own shop. Carbon is scraped out on all jobs except those with non-removable heads, where we resort to burning.

"We have light and heavy welding torches with cutting attachments and a lead burning torch as well. We haven't been doing much bronze-surfacing except an occasional water-pump, where it makes a very nice job. Neither have we done any hard-facing of parts.

"Steel welding rod is used on light iron and steel parts, bodies, fenders and frames. Cast iron rod is used on fan pulleys, gear cases, flywheel housings, mounting brackets, etc. Bronze rod is used on various castings and brazing jobs, where different metals are joined. Aluminum rod is used on aluminum crankcases, transmission covers, motor bases, etc.

"The welding rods we use mostly are: Bessemer steel, Norwegian iron and Tobin bronze, in the order named. Our welding equipment is also useful for the application of heat to parts and for the removal of paint by burning off."—*C. J. Martin, Supt. Motor Trans., Phillips Petroleum Co., Bartlesville, Okla., operating a fleet of 596 trucks, 675 passenger cars and 83 tractors.*

●

Welding Good for Bakery Machinery, Too

"OUR shop is equipped with a heavy welding torch with cutting attachment, a separate cutting torch, a lead burning torch and a carbon burning outfit. We do all of our own welding. Carbon removal is done by scraping only.

"We do not reclaim any parts by bronze surfacing; we just take care of broken parts with our welding equipment. Neither do we do any hard-facing. Copper-coated iron rod is used for fenders; steel rod for frames; cast iron rod for baking machinery, also some aluminum rod.

"Welding rods we use mostly are iron, steel and cast iron. Our welding outfit is used a great deal in the bakery, as well as in the garage. We use about one tank each of oxygen and acetylene per month. Welding equipment is obtained from manufacturers and welding rod from jobbers."—*Jean Babin, Garage Foreman, Hill Bread Co., Newark, N. J., operating a fleet of 40 trucks and 7 passenger cars.*

WELDING EXPERIENCES EXCHANGED *(Continued)*

Welding Experience of a 103-Truck Fleet

"PRACTICALLY all of our welding is done in our own shop; we only farm out difficult aluminum welding jobs. We remove carbon by scraping; have had trouble with carbon burning—distortion of valves and rings.

"Our shop is equipped with light and heavy welding torches, cutting attachment, cutting torch, lead burning outfit, carbon burning outfit and an electric welding set. While we have done no hard-facing of parts, we have built up many parts by bronze-welding and then machining to size. These include wheel adapters, housings, reamers and numerous other parts. We've been doing this for over three years. Other parts that we repair by bronze-welding include housings, crankcases, torque tubes, drive shaft housings, etc. We find this method of repair quite satisfactory.

"We have tried welding with copper-coated iron rod but have had indifferent success, which may be the fault of the operator. Steel welding rod is used on frames and bodies; cast iron rod for crankcases and housings and bronze rod as stated above.

"Types of rods we use mostly are as follows, in the order named: Airco, G. E. and Westinghouse. We also find other uses around the shop for the welding torch, in both cutting and straightening operations.

"We use about 300 cubic feet each of oxygen and acetylene each month, which is obtained from manufacturers of these gases. We use about 100 lbs. of gas and electric welding rod per month; also obtained from gas manufacturers and automotive jobbers, as is our welding equipment."—*Karl W. Lick, General Supt., General Material Co., St. Louis, Mo., operating a fleet of 103 trucks and 5 passenger cars.*

●

Welding Outfit Handy for Blacksmithing

"YES, we do all of our own welding, but our carbon is scraped out—not burned. We have two welding torches and a cutting attachment and find this outfit handy for many uses, including small blacksmithing work.

"We've done bronze-surfacing of parts and machined them to size; also hard facing of parts, with good results for the past three years. We use mostly bronze, mild-steel and cast iron rod, in the order named. Welding jobs in our outfit include water pump shafts and couplings, universal joints, fenders, frames, crankcases, etc., etc."—*W. H. Pierce, Foreman, Sutter County Repair Shop, Yuba City., Calif., operating a fleet of 33 trucks, 15 passenger cars and 19 other vehicles.*

(Please tear out and mail to The Editor, The Fleet Owner, 90 West St., New York City)

Question No. 39—Radiators

Do you make your own radiator repairs?..... Or, do you farm out this work?.....
If you make your own repairs, what equipment have you for this purpose?.....
.....
When replacement is necessary, do you replace tanks as well as cores?.....
What is your source of supply on radiators and cores? (Please check below)
☐ Truck Dealer; ☐ Radiator Mfr.; ☐ Radiator Distributor; ☐ Jobbers; Others .....
Do you find standard equipment radiators adequate for your operations?.....
What are your most common radiator troubles, and on what vehicles? (Please explain).....
.....
What steps have you taken to correct these troubles?.....
.....
What type of winter protection are you using? (Please check below)
☐ Automatic Shutters ☐ Cardboard Shields ☐ Water Thermostats
☐ Manual Shutters (Hand) ☐ Leatherette Covers ☐ Others .....
If thermostats are used, do they give trouble?..... Have you removed any?.....
Do you find any advantages to accrue from keeping the engines warm by any of the above methods, and what are they? .....
.....
Do you use anti-freeze in trucks?..... In buses?..... In passenger cars?.....
Please state the make or type of anti-freeze used. (CONFIDENTIAL) .....
What is your method of cleaning clogged radiators and how often is this done? (Please explain).....
.....
Remarks .....
.....
We operate.....Trucks; .....Buses; .....Pass. Cars; .....Other Vehicles

Note: If you cooperate with us and fill out this questionnaire, you will be entitled to a tabulated report covering all of the answers.

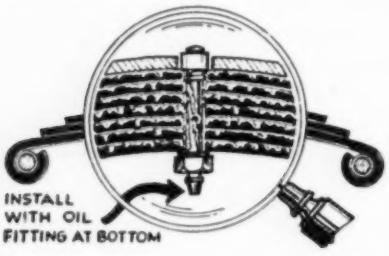
Swap your Maintenance experience with other fleet operators in this easy, convenient way. We do the work. You get the benefit.

Name of Firm .....
Address .....
City and State .....
Your name .....*Position*.....

for ROAD and SHOP

Lubricates Ford Rear Springs

FLEET operators will be interested in the Walker Lubricator which provides means of lubrication for rear springs of all Ford cars. Lack of lubrication causes dry, rusty springs which is the cause of most spring failures. Annoying squeaks also develop.



The Walker Lubricator is cadmium-plated to prevent rust. It is hollow-drilled with Alemite-Zerk oil-fitting. Square nut at top fits into recess in frame at top. Extra long threads fit all 1932 and 1933 Ford rear springs.

To install, simply remove nut of old center tie bolt. Knock out bolt with punch and hammer. Insert Walker Lubricator with square nut at top. Take up tight with deep socket wrench or open end wrench. Grease thoroughly with either S.A.E. 110 or 160 gear oil and for real stubborn cases mix small quantity of penetrating oil with the gear oil.

If your jobber can not supply you write direct to Walker Specialty Sales Co., 1406 South Grand Ave., Los Angeles, Calif., for further information.

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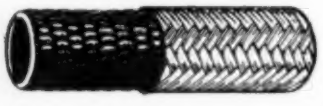
Packard Shielded Cable Housing

IN order to help to more completely eliminate spark interference in automotive radio installations, the Packard Electric Corp., Warren, Ohio, has developed a new product known as "Shielded Cable Housing."



This is a special woven loom around which is braided a fine copper wire shielding. Two sizes of this will take care of all jobs. One size is 3/16" inside diameter and is intended for all low tension and lead-in cables. The other is 5/16" inside diameter, for use in shielding the coil-to-distributor high tension wire and also the spark plug wires, if considered necessary.

The smaller size housing is generally used for shielding the aerial between the radio and the roof, or between the radio and running-board aerial. A special bulletin has been prepared, containing complete instructions and diagrams for installing shielded housing. Copies sent free on request.

•

Highway Safety Flares

LEGISLATION in several states requires trucks and buses to carry two or more red or yellow flares, to be used in the event of the vehicle's becoming disabled on the highway at

night. Pennsylvania is the latest state to adopt this practice, their Act No. 248 making mandatory the carrying of flares.

Triumph Highway Safety Flares are manufactured by The Triumph Fusee & Fireworks Co., Elkton, Md. These flares will burn brilliantly for 15 minutes, it is claimed, regardless of wind, rain or weather conditions.

No matches are required, as the friction cap ignition device lights the flare by simply tapping the end on any hard surface.

A rigid steel wire tripod is furnished for holding the flare. With this holder, the flare can be set up in a vertical position on any type of ground or grade. Triumph flares are packed in a strong wooden box and are safe to carry, being non-explosive.

Whether or not your state requires it, it would seem logical to carry a set of flares in every vehicle. Not only from a safety standpoint, but from a utility standpoint as well. Flares furnish an abundance of bright light for making road repairs, changing tires, etc., and their cost is not prohibitive. The manufacturer, mentioned above, will be glad to send further details without obligation.

•

Self-Closing Tire-Chain Links

BROKEN cross-chains need not worry the fleet operator whose vehicles carry a few spare "Monkey Links," according to the Flower City Specialty Co., Rochester, N. Y., makers.

"Monkey Links" are made in four sizes that will take care of any tire chain used in automotive work. When a cross-chain breaks, one of these links is inserted in place of the broken one, and the driver drives on. The first turn of the wheel closes the link and a permanent repair is made.

Samples, literature and prices will be sent promptly, without obligation. When writing to Flower City Specialty Co., at Rochester, N. Y., you'll mention FLEET OWNER, won't you?

•

K-S Battery Gauge

THE K-S Battery Gauge can be quickly and easily installed in or below the dashboard. After mounting, it is simply necessary to attach one terminal of the connection wire to the gauge and the other to the middle battery cell. It clearly indicates at all times the level of the water in the battery and is adaptable to any passenger car or truck now in use. The words, LOW and FULL are in black against a white background, with a red arrow indicating clearly the condition of the water in the battery. Chrome rim harmonizes with other instruments. It is moderately priced.

Complete details on the K-S Battery Water Gauge can be secured on application to King-Seeley Corporation, Ann Arbor, Michigan. You'll mention FLEET OWNER, won't you?

NEW STUFF *for* ROAD *and* SHOP *(Continued)*

Weed Tire Chain Catalog

A HANDY pocket-size reference book on Weed Tire Chains for passenger cars, trucks and buses, showing the new low prices has just been published by American Chain Company, Inc., Bridgeport, Conn.

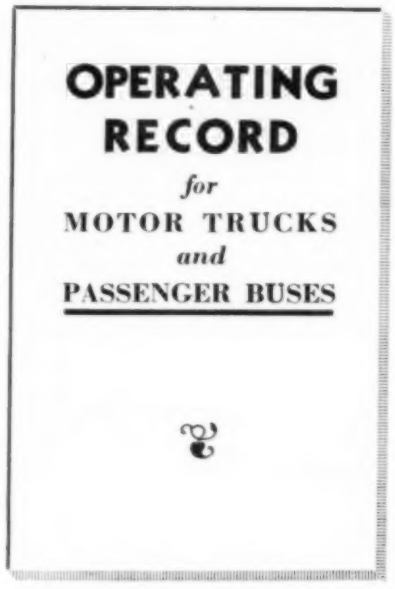
In addition to Weed Tire Chains it covers a number of other items that are of particular interest to fleet owners, such as Tire Chain Repair Tools, Sling Chains, Tow Chains, Cross Chain Repair Links and Campbell Hammerlock Cotter Pins. A copy of this book will be sent on request to any fleet owner. Ask for DH-4 Catalog.

•

Free Book on Truck Costs

PURELY to point the way to more efficient cost records in commercial motor vehicle operation, J. D. Burke, Director of Truck Sales of Dodge Brothers Corporation, offers to mail a copy of an interesting and valuable book to any one writing for it.

The book is a complete record and bookkeeping system for the motor truck and passenger bus owner. It records the work done by the truck in terms of mileage, hours of operation, number of trips and stops, loads, gross earnings, drivers' and helpers' wages, etc. Expenditures are broken



up into fuel and oil costs, repair and maintenance, accident repairs, and indirect costs—the latter including overhead, taxes, insurance and similar items.

Appended to the record sections of the work are easily understood articles dealing with such matters as the establishment of repair and maintenance reserves, truck depreciation, book value of truck equipment and other questions arising in truck and bus operation.

The offer of a free copy of the book is entirely without selfish motive. There is not a line of advertising in it. For prompt attention, when you send for your free copy, please mention FLEET OWNER.

•

Pedrick Piston Ring Compressor

A NEW piston ring tool is announced by Wilkening Mfg. Co., Philadelphia, Pa., makers of "Pedrick" piston rings. It can be used when installing pistons either from above or below.

One of the features of the new tool is that no part of it extends more than 3/16" out from the piston, so that it will not interfere with the crankshaft when installing pistons from below.

It is universally adjustable to all ring sizes, from 2-9/16" to 5⅛". The compressing band is formed by joining two pieces having catches and slots, not unlike a popular type of hose-clamp, so that the size of the clamp can be adjusted before compressing the rings. Wedge-shaped tightening tools and two sets of bands make the tool universally adaptable. In operation, the wedge-shaped clamp draws the bands tight around the rings, compressing them.

•

Oxweld Aluminum Flux

A NEW all-purpose aluminum welding flux, (Oxweld Aluminum Flux) is announced by The Linde Air Products Company, 30 East 42nd Street, New York, N. Y. This new flux is intended to replace the two fluxes previously marketed, one for welding pure aluminum and the other for welding aluminum alloys.

Oxweld Aluminum flux does everything that, a few months ago, required two separate fluxes to do. It is a better aluminum flux, and its use will save time and improve the quality of the work. The new flux is packed in ¼-lb. jars which in turn are packed in neat cardboard cartons.

Thermostatic Mixture Control

THIS device, a thermostatic valve, designed for installation on the intake manifold of any automotive engine, remains closed when the motor is cold, allowing starting of the engine as under ordinary conditions.

When the motor warms up, it automatically opens, allowing additional air to enter the intake manifold. It is claimed by the makers to eliminate "loading" and to effect gasoline savings; also to maintain the correct proportion of air to gasoline at all times, providing proper carburetor adjustment is made after installation of the device.

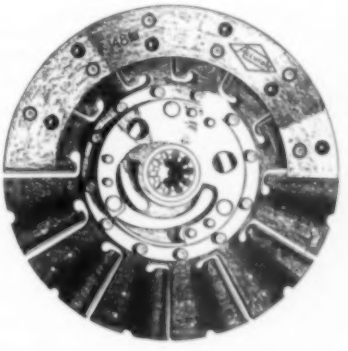
Just as soon as the motor begins to cool off, the thermostatic valve gradually and automatically closes. Such claims as 10% to 35% increase in gas mileage, faster acceleration, easier starting, reduction of oil dilution and better motor performance, are made. Made by Blancke Products Company, 627 W. Lake St., Chicago, Ill.

•

Springless Clutch Plate

POWERFLEX—the new Accurate flexible center clutch plate operates on a new, patented, cantilever principle which marks an advancement in vibration dampener clutch plate design.

Powerflex has no springs. Instead of springs the exclusive cantilever construction is said to take up torque, absorb road shocks, dampen motor vibration, and assure silent, smooth, and reliable clutch performance. Safety



stops are provided which transfer the entire load from the cantilevers to the hub when the load is excessive, thus preventing any possibility of the levers breaking.

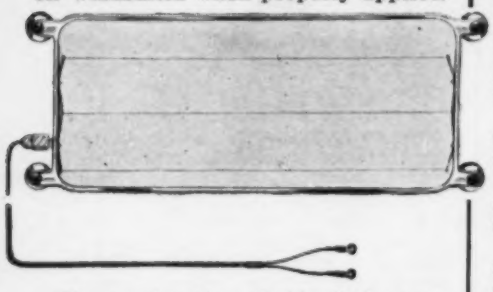
In addition to the vibration-dampening features of the Powerflex, it also employs advanced principles of cushioning clutch contact with the flywheel, according to the manufacturers. Write to Accurate Parts Mfg. Co., 735 Central Ave., Cleveland, Ohio, for details and prices. Sold through jobbers.

NEW STUFF *for* ROAD *and* SHOP (*Continued*)

Electric Windshield Defroster

THE improved Casco deluxe windshield defroster, pictured here, is designed to give the greatest possible protection for winter driving, on trucks, buses and passenger cars.

It measures 18½ x 7¼ inches and is applied to the windshield by four rubber suction cups of new design, said to prevent defroster from falling off windshield when properly applied.



The construction of this device provides a sealed "dead-air" pocket which keeps mist and condensation from forming on the inside of the windshield without the use of current. When ice, sleet or wet snow cling to the windshield, the current can be connected. Through the three heating wires, heat is distributed over the space to be cleared, warming the windshield to about 90 degrees and melting it clear.

For full details, list price and discounts, write Casco Products Corporation, Bridgeport, Conn. Sold through jobbers.

●

New, Larger Simmons Plant

THE Simmons Manufacturing Company, of Cleveland, Ohio, manufacturer of replacement parts and accessories, has purchased a new and larger plant to provide adequate facilities for their growing business.

The new property was built at a cost of $380,000 and includes 100,000 square feet of factory floor space on a three and one-half acre site. All manufacturing facilities are conveniently located on one floor with ample underground space for the storage of raw materials. Offices occupy the second floor.

The Simmons Manufacturing Company, founded in 1917, is an example of the progress which can be made by catering to the needs of the automotive service trade with dependable quality material. Today, Simmons does an international business. More than one hundred sales representatives are employed. Warehouse stocks are located in Chicago, Atlanta, Philadelphia, Dallas, Kansas City, Los Angeles, San Francisco, Springfield, Mass., and Toronto, Canada.

The Simmons Line includes mufflers and carburetors for all cars, Silver King Hydraulic Jacks, a complete line of parts for popular cars, and many accessory items.

Gauge Measures Ring Grooves

AN accurate tool of extreme simplicity for measuring the depth of piston ring grooves is now being offered by the Wilkening Manufacturing Co., Philadelphia, Pa., makers of "Pedrick" piston rings.

In presenting this gauge, the Wilkening organization points out that groove depths vary as much as .010 inch above or below the listed specifications. Production practice in the car factories allows for these tolerances, not only in the same engine, but in the different grooves of the same piston.

Furthermore, any car coming into a shop for a piston ring installation may previously have had replacement pistons installed with ring groove depths quite different from the listed specifications.

To use the Pedrick gauge, a steel straight-edge is placed along the skirt of the piston, as shown, and the gauge inserted into the groove, under the scale, until it bottoms. The reading on the gauge will indicate the depth.

The only safe way for the mechanic to be sure that rings of the proper thickness are installed is to measure the groove depth. This can now be done quickly and accurately with the Pedrick gauge. Each tool is made from selected steel, closely calibrated, with fractional dimensions etched on. The list price is 25 cents each.

●

"Red Insul" Insulating Compound

HERE is a new insulating compound, just brought to our attention, that is said to be ideal for waterproofing the ignition system, for repairing cracked or burned distributor caps, and for general insulating use around the electrical department of the fleet shop.

"Red Insul", as it is called, is an organic colloid, held in solution by solvent ether. Naturally, its evaporation properties are very rapid and the compound itself is said to be fast-drying and to set very hard within a few hours.

Any insulating compound should, of course, be impervious to the action of heat, cold, moisture, etc. This one is claimed to have these qualities, and also to have low surface-tension, which means that it will penetrate the minutest of cracks or holes.

Additional uses are for the repair of armatures of generators and magnetos; also the waterproofing of ignition cable, coils and other apparatus where shellac or other compounds are usually put to work.

Interested fleet operators can get further particulars and a small working sample, by addressing Insul Chemical Company, 1457 Broadway, New York City.

Valve Seat Dial Gauge

WHILE designed for use with the Hall line of valve seat grinding equipment, and used by many of the factories for gauging valve seats in production, the Hall valve seat dial gauge shown here is becoming popular with fleet maintenance shops.

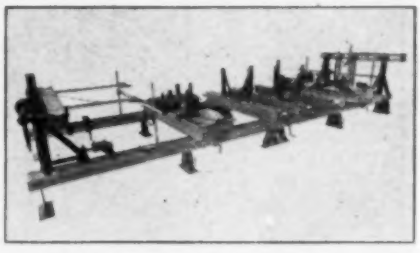
It is simple in construction, easy to read, accurate, and capable of being used with any pilot, according to the makers. Write to Hall Mfg. Co., Toledo, Ohio, mentioning FLEET OWNER, for complete literature, prices, etc. Sold through automotive jobbers.

●

Announce New Frame Straightener

THE Bendix-Feragen Chassis Straightener, which straightens frames, axles and rear axle housings without removing them from the automobile, is announced by The Bendix Products Corporation of South Bend, Ind.

The Bendix-Feragen Chassis Straightener is produced in two sizes —medium duty, for passenger cars and light trucks, and heavy duty, for cars, trucks, busses and trailers. It is particularly designed to straighten the new "X" and "A" type frames. Swayed frames are "pulled" into place and power may be applied at any angle of the vertical or horizontal. Frame channels may be stretched by pulling, or shortened by pushing, due to firm buttresses at the ends of the machine. Mechanical



means are provided to square the heaviest chassis as the work goes on and "dead cars" are handled by one man using the built-in winch.

Special built-in power units assure safety in operation and long life. Either machine handles vehicle treads from an Austin to the widest truck. The machine is now in production and available to the trade; literature and complete details will be sent on request.

Effecting Economies in the Fleet

(*Continued from page* 14)

equal to oil enamel.

During 1924, there appeared an oil enamel system that has since played a major role in the finishing of commercial vehicles. For years prior to that time, oil enamel had been used by the railroads and varnish enamel had been used by the amateur for automobile repainting. The oil enamel system consisted of: 1 or 2 coats of primer-Sealer; 1 coat of Surfacer; and 1 coat of Enamel.

The primer-sealer coat dried overnight, the surfacer in about 6 hours and the enamel 24-36 hours. Employing this system, a truck could be repainted in 4 days or even less if there was a minimum of lettering and striping.

About three years ago developments in the field of synthetic resins of the phenol-aldehyde type permitted the quickening of drying time of enamel, apparently without sacrifice in durability or other properties—likewise drying time of primer-sealer was shortened. This made it possible to apply 2 coats of primer-surfacer in the same day, as it dried in 4 hours ready to recoat—followed with one coat of enamel the second day, which dried in 24 hours. This therefore reduced time necessary for repainting about 1 day.

The newest entry in the field of automotive finishes in a synthetic enamel finish of an entirely different type—one having as the varnish base a straight synthetic resin of the glycerol phthalate type, commonly known as glyptol. The complete finish consists of prime-surfacer, enamel, and possibly clear finishing varnish. The primer is frequently made on an oil or varnish base, while the other materials are synthetic. As a general rule, the use of clear finishing varnish is not recommended except for penciling decorations.

Synthetic finishes incorporate most of the properties desired for automotive work. They are suitable for use over wood as well as metal. All of the synthetic finishes are designed for spraying and the products of a few manufacturers may also be brushed. Broadly speaking, they do not brush as well as oil enamel but spray better. The undercoats dry approximately the same as the undercoats in the quick-drying oil enamel system, but the enamel coat dries more rapidly. Two coats of the enamel may be applied in a day and it is ready for masking the following day, or sooner. Synthetic finishes have considerably less body per coat than varnish or oil enamel and on the average they have less initial gloss. Possessing excellent general durability, they are outstanding in freedom from dulling and color fading. The choice between an oil or varnish enamel and a synthetic enamel is close and is governed largely by the circumstances connected with the particular fleet of equipment, such as the type of vehicles, number of colors and the particular colors, appearance required, importance of speed, shop conditions, etc.

This review of the various types of painting systems has been made because of the fact that through the adoption of the best system for any given work, painting costs may be reduced—and the newer types of finishes offered purport well to give us better appearing vehicles at lower cost.

(EDITOR'S NOTE:—There's more to Mr. Newton's treatise on Fleet Economies than we have already published. There will be an installment on Tires, one on Safety, another on Garage Expenses, and the last one will cover the purchase of new vehicles).

Get Every PAYLOAD MILE You Pay For

MARMON-HERRINGTON

ALL-WHEEL-DRIVE Trucks and Truck-Tractors

Positive Traction Eliminates Costly Wheel Slippage

AMERICA'S fleet owners are paying thousands of dollars every day for extra gasoline and oil and extra tire and parts wear caused by that arch enemy of efficient performance — wheel slippage.

There is one sure way to eliminate this needless expense — use equipment that gives positive, sure-footed traction under all conditions. No truck on the market more fully meets this requirement than Marmon-Herrington.

Repeated tests show that the all-wheel-drive ability of Marmon-Herrington trucks actually cuts payload costs by more than 13 percent. In one series of trials between Indianapolis and Chicago, one of the smaller Marmon-Herrington models hauled 7½ tons of payload with 13.8 percent less mileage showing on the odometer and 13.8 percent less cost showing on the books.

If you want to get every single payload mile you pay for—write today for full information about the new Marmon-Herrington line which includes 21 models of 1½ tons and upward—four and six-wheel-drive. Prices are at a new level for all-wheel-drive advantages and performance. Your name and address on the coupon below will bring complete facts without obligation.

SIX TIMES GREATER SALES IN 1933

MARMON-HERRINGTON CO., INC., INDIANAPOLIS, IND.

Send me actual proof that Marmon-Herrington equipment—by the elimination of wheel slippage—cuts payload costs as much as 13.8 percent.

NAME.....

ADDRESS..... CITY.....

★ THE BEST TRUCK EVER BUILT

NEW LOW PRICES!

1½-2½ TON REO SPEEDWAGON

$595

Chassis f. o. b. Lansing Tax Added

FAMOUS 6 CYL. GOLD CROWN ENGINE • FULL-FLOATING AXLE • BIG FRAME • HYDRAULIC BRAKES • HEAVY DUTY TIRES

YOU CAN'T MAKE A BETTER INVESTMENT IN TRUCKS!

WRITE FOR FOLDER AND SPECIFICATIONS

REO MOTOR CAR COMPANY
LANSING, MICHIGAN

REO TRUCKS

TOLEDO

WATER PUMP PARTS

insure a tight, efficient cooling system on every truck or bus in your fleet. You can depend upon them to fit accurately and you can get quick service from your Toledo jobber

THE TOLEDO STEEL PRODUCTS CO., TOLEDO, OHIO

A complete line of superior quality axle shafts for all makes and models of passenger cars, trucks and buses. A special engineering service to study your individual problems is available to all responsible fleet operators.

Write for complete information

The U. S. Axle Co. Inc., Pottstown, Pa. U.S.A.

Preventing Accidents in Bus Fleets

(*Continued from page* 16)

a detailed report on the student each day answering specific questions which show whether the student has developed any unsafe habits which did not show up in the school. The regular drivers are asked to check the unsafe practices listed elsewhere in this article.

In our experience during the past four years, about 15 per cent of the applicants have been rejected. The principal causes were unsatisfactory references, physical defects and poor performance in road tests.

Those rejected on account of unsatisfactory road tests were men who reveal one of four disqualifying characteristics: (a) too nervous; (b) slow thinker; (c) indifference; (d) unsafe driving habits. The first named were considered unsafe because they showed by their nervous actions that in the stress of emergency they would be quite sure to do the wrong thing, would "go to pieces" or lose their heads and consequently lose control of the vehicles. The second named were, to use the vernacular, "just plain dumb." A slow-thinker is a risk and therefore subject to rejection. The third named included a few men of the type we call "smart-alecks." They knew it all. They paid little attention to the instructor. And just because they were not enough interested in their future jobs to be alert, attentive and earnest, we simply could not afford to waste time with them.

The reports of the old drivers were turned in each day and the students indulging in any of the faults listed are taken in hand by the instructor and corrected. But if any of the faults continue to show the student is rejected.

The initial training of the bus driver is but a small part of the program, however. He must be continually trained and educated. Continued training after employment might be more accurately termed supervision but it is constant training nevertheless.

No accident, regardless of the nature of the accident and extent of damage is allowed to be covered up or passed by without investigation. Some action is taken in the case of every mishap. Either the driver is exonerated or else he is held responsible. In all cases where discipline is administered the past record of the driver is considered in deciding what that discipline shall be. Discipline of course, must be educational in its effect.

Our aim is to encourage drivers to voluntarily and of their own free will be safe and efficient. The regular bonus of one-fourth cent per mile which all drivers receive is added to by an extra one-fourth cent for "Star" drivers. A star driver is one who has had no accidents for a year and his record otherwise as to personal conduct, honesty, courtesy and dependability has been beyond criticism. A gold safety button of handsome design is also awarded the driver who goes a year with a clear safety record. For two consecutive years he receives a pearl studded gold button; for three years a ruby studded button; for four years one studded with sapphires and for five years a diamond studded gold button is awarded. Regional awards are also made every sixteen weeks in each of the three territorial groups operating the greatest number of miles per accident and each driver in the three winning regions receives a special cash award.

It is because the very existence of the bus business depends upon the safety with which buses are operated that so much time, patience and money is spent on this phase of the driver's training and supervision.

The supervision or continued education after he gets his job must be intelligently conducted. Bantering and nagging will only make the driver nervous or get him "sore" and he is less safe than if you had let him alone. The better way is to give him constructive education, to give him oft-repeated, perhaps, but convincing, intelligent admonition and instruction. At our meetings and through our bulletins regularly issued we discuss the accidents which do occur and show why they occur and point out the practices that must be stopped. Something definite is thus brought to their attention in no uncertain terms which they must correct.

Our greatest problem today is the protection of our vehicles from the recklessness of the drivers of other vehicles who have no supervision, are not sufficiently instructed as to safety and are often irresponsible and unfit to operate any kind of a motor vehicle on public highways. But by the classification of accidents as to type, causes, etc., we have been able to make rules and carry on instructive safety drives that require our drivers to take precautionary measures that have greatly reduced the number and seriousness of all accidents regardless of type or cause.

We started our program of training and education in July 1929. At that time we were operating an average of about 10,000 miles for each accident reported and this has been steadily improving until now we operate our buses each year a distance equal to several times around the world for each accident, including even scratched fenders. One operating region recently achieved a record of close to a million miles without a single accident of any kind and in our last safety contest of sixteen weeks' duration ten out of eighteen regions each averaged separately over 100,000 miles per accident, the remaining eight regions averaging from 40,000 to 95,000 miles per accident.

●

Let's Think About Tire Mileage

(*Continued from page 22*)

a great deal. I know some operators who have tried to adjust the trouble by decreasing the air pressure in the tire having the more wear, believing that the tire was being subjected to more than its share of the load and that the reduced pressure would mean equalization of the load between the dual tires. Decreasing the air pressure as a remedy is a mistaken idea, because tire engineers who have given much study to the problem agree that even if the two tires do carry approximately the same load, the tire having the lesser pressure certainly must contend with more flexing. which brings us to the same old story of internal heat, with premature tire failure as the result. So, again the tire is blamed for unsatisfactory service and an adjustment is demanded, although the responsibility for failure rested wholly with the truck operator.

If the truck operator will see that the truck is equipped with proper tires to carry the loads for which the truck is intended, his tire troubles will be reduced to a minimum. Then, of course, the operator's complaints will be few and far between. After all, a complaint made against a tire is also one against the truck itself.

Truck manufacturers' branch and dealer organizations are supplied with considerable informative material, especially along the lines of load capacities of the tires with which the trucks are equipped, and I urge upon all to make thorough use of this material and work more closely in this respect with the tire com-

What! Four O'clock!

"I'*ll sure have to step on it to get through my route by five!*"

And that's the way most accidents happen:—

SPEEDING to "Make Up" Wasted Time!

BUT this won't happen if your truck is equipped with the SERVIS RECORDER. It "shows up" all wasted time on its chart. See, on the chart below, how the truck stood idle from 2:00 to 4:00 in the afternoon. No chance of "making up" *that* delay, even if the driver does speed and does "get through" on time. The driver knows this, so he doesn't speed and he does't have accidents.

Steady work — *that's the idea!*

Just enough work for the day—not too much, not too little, and keep 'em at it. That's good for the truck, the driver, and service to your customers. How to do it? Only one way—get a picture of the day's work on chart of the SERVIS RECORDER. The coupon below brings you the whole story. *Act today.* THE SERVICE RECORDER CO., CLEVELAND, O.

This chart shows up all the delays. Here's a stop of 2 hours!

THE SERVIS RECORDER
"Keeps Trucks Busy"

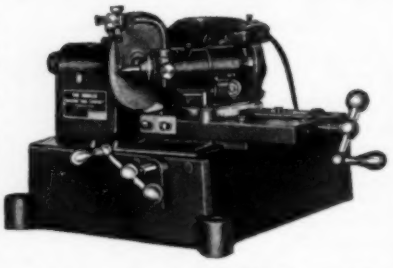
THE SERVICE RECORDER CO. F.O.
1422 Euclid Ave., Cleveland, O.
Please send us, without obligation, "*10 Ways of Getting More Work out of Motor Trucks.*"
Company.....
Attention of.....
Street.....
City & State.....

THERE'S STILL ENOUGH COLD WEATHER LEFT TO MAKE IT PROFITABLE TO SEE YOUR SUPPLIER ABOUT

DU PONT ZERONE
The Improved Methanol ANTI-FREEZE
E. I. Du Pont De Nemours & Co., Inc., Ammonia Dept., Wilmington, Del.

SPONGEX
(Sponge Rubber)
Honeycomb Cushions
for truck and bus seats cost less, last longer and are more comfortable.
Write for booklet
THE SPONGE RUBBER PRODUCTS CO.
Derby, Connecticut

VAN NORMAN
New Model X-A Valve Refacer for fleet service shops; 5/16" to 11/16" in one collet; accurate within .001"; 30°, 45° and 60° adjustments; ball bearing wheel spindle; deep well ribbed base; no vibration. Compare with any refacer at any price. Write for bulletin



VAN NORMAN MACHINE TOOL CO.
169 WILBRAHAM ST. SPRINGFIELD, MASSACHUSETTS

SELF-CLOSING MONKEY LINK
NO TOOLS REQUIRED
Zee How Ezy
This is the Link

Pat. No. 1,438,560
Trade Mark Reg. in U. S. Pat. Office

WHY BUY New Chains ?
Repair Them With Self-Closing
MONKEY LINKS
Carry them on your trucks and busses. Your driver can make instant repairs—no delay. No tools required. Insures safe driving at all times. Fits all tire chains.
Flower City Specialty Co.
ROCHESTER, N. Y.
At All Reputable Jobbers

panies supplying the tire equipment.

I call particular attention to the "load and service diagram" on the first page of this article, because it illustrates quite graphically the percentage of service a tire will give according to the overload it carries.

In closing, there are just a few points I wish to emphasize:

See that the air pressure in the tires is checked at least once a week, thereby avoiding underinflation and overinflation.

Have the wheels checked four or five times a year to guard against misalignment and other mechanical irregularities.

Keep the brakes in proper adjustment; avoid sudden stops; slow down gradually.

Avoid using maximum acceleration in starting.

Drive at a moderate rate of speed around turns.

Operators will find that the time they devote toward the elimination of various abuses to tires will pay big dividends in decreased costs and increased efficiency.

●

Minimizing Monoxide in Fleets

(*Continued from page* 24)

the hospital and four went to their homes."

These are but a few of the many stories that are appearing from time to time in newspapers and so great has the menace of carbon monoxide become throughout the country that public health officials, automobile clubs, police chiefs and mayors are warning the citizens in their communities to beware of this deadly gas. The fleet operator, too, should take extra precautions at this time of the year, not only bus operators, but those operating trucks as well. Failure of most truck operators to install heaters in their truck cabs to keep the drivers warm, is directly resulting in one thing—the drivers will have a tendency to keep all windows closed during cold weather. Monoxide gas, coming through the floor-boards, does the rest.

It might be well to analyze the situation from the technical side and see just how carbon monoxide can best be minimized—it can't be totally eliminated, of course. Incomplete combustion causes the formation of carbon monoxide. If the carburetor and timing are out of adjustment, the engine becomes a veritable manufacturing plant for this deadly gas. A careful study of the content of carbon monoxide in exhaust gas has been made recently by the same engineers who created the Cities Service Power Prover. After making tests in hundreds of buses in New York City they found that 90 per cent of the drivers and conductors of these buses suffer with headaches while on the job. That is a simple way of describing how carbon monoxide acts. The gas itself is odorless, colorless and tasteless. If breathed, it first brings on headaches, often nausea, then unconsciousness and finally death.

The degree of combustion is determined by the proportion of gasoline and air in the fuel mixture. The air-fuel-ratio, in other words. Complete combustion occurs when a pound of gasoline is mixed with 15 pounds of air. In practice, it is very difficult to obtain this perfect mixture. Experiments have shown that a mixture of approximately 13 to 1 is the ideal that we can expect, although this means that there will be a small degree of incomplete combustion. However, with this mixture, carbon monoxide in the exhaust gas is practically negligible and the possibility of air pollution should not exist. It is when the motor is poorly adjusted and the mixture runs from 9 to 11 pounds of air to a pound of gasoline, that exhaust gases become a serious problem. And tests have revealed the

fact that approximately 60 per cent of all truck motors on the road today are poorly adjusted and thus constitute a direct menace to public health.

Scientists have long recognized the seriousness of carbon monoxide in exhaust gases, but prior to the development of exhaust gas analysis apparatus (of which the Power Prover is one that you're probably most familiar with), there was no sure way of readily determining the percentage of combustion efficiency of automotive engines. Now, with apparatus such as the Power Prover, it is possible to tell, in about 30 seconds, the combustion efficiency of any engine using gasoline as a fuel. And the percentage of carbon monoxide in the exhaust gases is readily learned from the following conversion table:

Combustion Efficiency	Percent Carbon Monoxide
100%	—
90%	2
80%	4
70%	7
60%	10
50%	13.7

Thus, it will be seen that by "Power Proving" an engine, and bringing its combustion efficiency to 90 per cent, the amount of carbon monoxide in the exhaust gas can be reduced to an almost harmless minimum. This can be done, as related previousiy in this publication, by giving each engine the air-fuel-ratio analysis and then the tuning routine to bring the combustion efficiency up to the desired percentage.

Fleet operators will undoubtedly give this subject more attention as time goes on. It is well to understand that there are a number of factors that may produce incomplete combustion. Improper adjustment of the carburetor, as we all know, is one. Inefficient spark plugs, another. Imperfect timing is still another, and the tuning routine, after exhaust gas analysis, is what does the trick. Every part of the engine should be adjusted to manufacturer's specifications—at least all of those parts that influence combustion.

Many large companies are today eliminating the excessive causes of carbon monoxide and also saving on their gasoline and oil bills. By making a motor run more efficiently, through a test and tuning routine, thousands of companies are today protecting their employes, preventing costly accidents and saving on their petroleum products bill. We cite a few cases in point:

The experience of Drake Bakeries, Inc., presents another angle in successfully eliminating food-tainting exhaust odors that threatened to spoil cakes during delivery. This is typical of the work Cities Service Oil Companies are doing to minimize the offensive gases. Not only were these fumes removed and much food wastage eliminated, but gasoline costs were cut 5 per cent to 10 per cent. Another large operator, Federal Baking Company, saved 8 per cent on gasoline and 25 per cent on oil while minimizing poisonous exhaust gases.

In an effort to keep the importance of carbon monoxide protection before the eyes of every motor vehicle owner—individuals and fleets—Cities Service is distributing large attractive stickers to be pasted on the inside of garage doors. They read: "Caution! Keep This Door Open While Motor Is Running! Exhaust Gases from Your Car Contain Carbon Monoxide, a Deadly Poison!" Fleet operators desiring a reasonable quantity of these stickers may have them without obligation on application to The Editor, FLEET OWNER, 90 West St., New York City.

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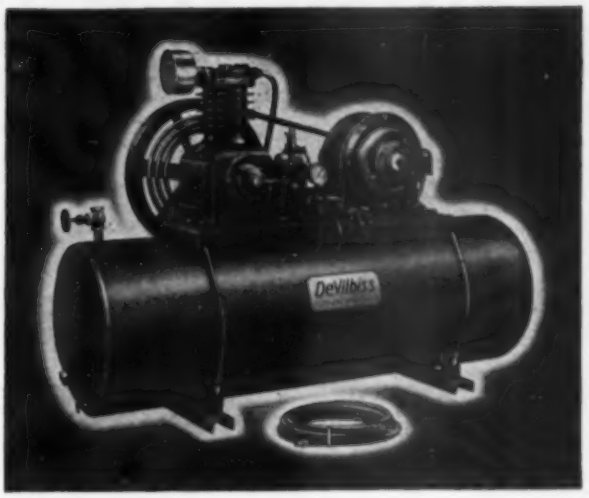

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Before you buy any air-using or air-handling equipment, air compressors or hose, see the wide DeVilbiss Line for fleet service garages. At your nearest DeVilbiss distributor. Or write for catalog.

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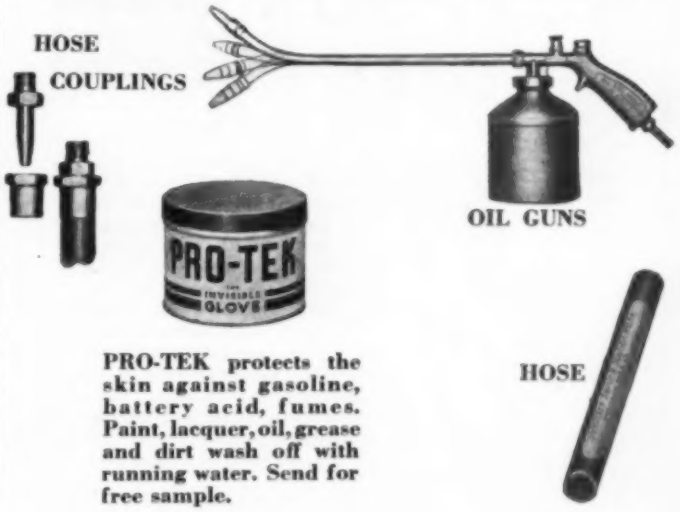

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2500 ROOMS — $2.50 UP
LEONARD HICKS, Managing Director
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A Course in Automotive Ignition

(Continued from page 28)

opened, the valve (H) causes the vacuum to be switched to the other side of the piston, which advances the timing. This system has other advantages than the retarding of the spark at idle. It also retards the spark when the engine is operating under heavy loads and advances the spark when the engine is operating under light loads.

In another arrangement shown in Fig. 4 the same results are obtained at idle, but the control of the timing when the engine is running is similar to that shown in Lesson No. 24 of the Mallory Ignition Course. Instead of having a governor to advance the timing, a spring (N) is used, which always holds the timing in full advanced position, unless the vacuum should collapse due to acceleration or heavy load conditions. Under these conditions, the brake shoe (O) engages the disc (P), which compresses the spring (N) and retards the timing.

Fig. 5 illustrates another method, in which the vacuum is also switched from one side of the piston to the other to retard the spark when the throttle is closed, and to advance the spark when the throttle is opened. In this arrangement, a centrifugal governor is used. Normally, the governor weight would remain in a position so that the spark is ten degrees advanced. It is held in this position by spring (Q), but, when the vacuum is high at idle speeds, the brake shoe (R) holds the governor weight "in," overcoming the spring (Q), which retards the spark. In this system, the spark is also controlled according to engine load and speed conditions.

In Fig. 6 is shown another arrangement. The spring (A) retards the spark when the throttle is closed, and, as soon as the throttle is opened, the valve (B) permits the vacuum to draw the piston up, compressing the spring (A) and thus advancing the spark.

This lesson is designed to inform the reader of these new developments in engine timing, and demonstrates why it has not been possible heretofore to get better results with the ignition systems ordinarily in use.

●

War Dept. Approves Size-Weight Restrictions

THE War Department has taken a position which should put an end to the misrepresentations which are constantly being made that the taxpayers are burdened by excessive costs caused by highway construction of extra width and thickness for the accommodation of heavy commercial vehicles.

The Bureau of Public Roads has repeatedly stated that climatic conditions and the demands of the private passenger car owners for hard smooth surfaces make necessary a type of construction that will carry vehicles of the sizes and weights recommended by the American Association of State Highway Officials.

Federal Aid for highways is extended for two reasons:—1, to provide post roads for carrying the mail and, 2, to meet the requirements of national defense.

The Department of Agriculture recently submitted to the War Department the recommendations of the American Association of State Highway Officials and received a reply from the Chief of Staff and Acting Secretary of War, as follows:

"Highways designed to safely carry vehicles of the weights and sizes provided in the recommended Code, it is believed, will be adequate for the War Department needs in time of war or national emergency.

"In the opinion of the War Department, proper provision would not be made for the National Defense if

our major highways were designed for vehicles of smaller dimensions and weight."

This definite statement as to the War Department's requirements for the necessities of national defense should put a stop to the efforts to reduce size and weight limitations in state legislation below the standards fixed by the highway builders themselves.

●

Motor Truck Directory Just Published

A REFERENCE book dealing with the traffic and operating problems confronting motor truck haulers and users of trucks in general has just been published by Traffic Publishing Company. It is a 725-page volume, 8½ x 11 inches, with flexible leatherette binding.

Written by leading authorities in all branches of the motor truck field, it contains information on the operation of trucks, supervision, costs of operation, selection of vehicles, accounting, insurance, terminals, etc. The business side of trucking is covered by sections on traffic management, rates, tariffs, shipping documents, co-ordination with railroads and rail and truck rates.

Regulations by State and Federal Commissions has been described in a thorough manner and the volume includes Common and Contract Carrier Regulation, Summary of State Laws, Administrative Regulations, Proposed Federal Regulation, and Supreme Court Decisions affecting Trucks. The N. R. A. and the Motor Truck Code are completely explained.

The book contains many operating and accounting forms as well as tables and charts for the information of the truck operator and others. The Directory contains the names and points regularly served of over one thousand motor truck carriers.

It is intended to serve the needs of truck operators, shippers, lawyers, accountants, and others interested in motor truck activities; a comprehensive publication on commercial highway transportation. The price is $10.00 and it may be obtained from Traffic Publishing Co., 100 Sixth Ave., New York City, or from the Book Department, Ferguson Publishing Co., 90 West St., New York, N. Y.

●

Does Own Gas Welding; Farms Out Electric

"ABOUT sixty-five per cent of our welding is done in our own shop; the other thirty-five per cent (mostly electric) is farmed out. We do not burn out carbon, but scrape it in connection with valve and piston inspections.

"Our welding equipment consists of a welding torch and a separate cutting torch. We have not as yet done any reclaiming by bronze-surfacing, nor by hard-facing, but we do all general repair work to broken automotive parts, such as fenders, bodies, frames, wheel spokes, radiator support rods, castings, Bendix drives, etc. We also use welding to seal speedometer cables. We have been doing this work for three years and find it satisfactory.

"We use mostly bronze rod; then copper-coated iron; then steel. Our welding equipment also comes in handy for removing frozen parts, pins, bushings, sleeves, straightening frames and for all heating work. Equipment and welding rod are bought from jobbers; gases from an oxygen manufacturer."—*Clyde Paul, Mgr., Saunders System, Houston, Tex., operating a fleet of 10 passenger cars.*

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. . . when you have a SKINNER OIL RECLAIMER in your garage—it becomes practical to use the particular oil that has proven best for your fleet and, when the time comes to change that oil, the reclaimer will restore all the lubricating qualities it originally possessed—at a cost of 6 cents or more per gallon. Oil does not wear out—it simply becomes contaminated with foreign matter through use, and years of experience has definitely proven to thousands of fleet superintendents that they can reduce their motor maintenance costs and oil bills from 40 to 60 per cent by removing this foreign matter with a

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LOS ANGELES:	Utility Trailer Sales Co.	1600 So. San Pedro St.
NEW YORK CITY:	Metropolitan Truck Equip. Corp'n	Third St. & West Ave., Long Island City
OKLAHOMA CITY:	Leland Equipment Co.	1637 West Main St.
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PORTLAND:	Murry Jacobs Co.	146 N. Sixth St.
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UTILITY TRAILER MANUFACTURING CO.

BOX 1407, ARCADE ANNEX

LOS ANGELES CALIFORNIA

Trailers to the Front!

By J. D. Burke,

Director of Truck Sales, Dodge Bros. Corporation

ONE of the most interesting recent developments in the merchandising of trucks is the growing number of orders placed by fleet operators in practically all parts of the country for truck and trailer equipment. Much of this activity is by firms who hitherto had only casual experience with trailer operation. The purpose of these few lines, therefore, is not to point again to the generally admitted advantages of truck transportation, but to emphasize the values and economies of the tractor and semi-trailer combination.

An apt illustration of the function of the semi-trailer is to call attention to the fact that a draft animal—horse, mule, camel, etc.—can PULL a load several times as great as the burden it can safely carry on its back. Since the same relation exists between the straight truck and the trailer outfit, the employment of this type of transportation means greater efficiency and economy. One tractor, pulling one semi-trailer, will transport three and four times as great a load as three straight trucks.

In the case of the tractor-and-semi-trailer combination we have a single engine and six, eight or ten tires. In the case of three straight trucks we have three engines, three times the fuel and oil consumption, and tire wear imposed on from twelve to eighteen tires.

Trailer operation is of peculiar advantage to concerns doing general or contract hauling. The truck-owning merchant, through his fleet manager, has it in his power to keep truck loads within the limits of prudence and safety. A haulage firm using straight trucks finds this task much more difficult and, in not a few instances, impossible of accomplishment. When the driver calls for materials or goods estimated by the customer to weigh five tons, the load may be six or seven tons—enough to strain the entire truck and to endanger the road bed on which the necessarily concentrated load must travel.

Haulage firms naturally have no desire to disappoint a customer through inability to handle a shipment too large or too heavy for a motor truck. But they meet all contingencies by availing themselves of the flexibility of the semi-trailer, which makes it possible to spread the load on a body unencumbered by a power-plant, over another axle and over another set of tires.

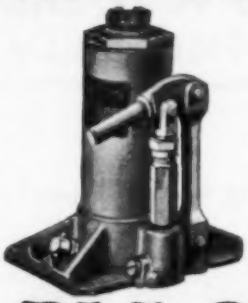
So it comes about that loads which formerly had to be carried on five-ton straight trucks are now transported quickly and efficiently by 1½-ton tractor and semi-trailers. The five-ton trucks would in many cases be overloaded. With the tractor-semi-trailer combination the necessary load balance is secured, with proper weight distribution on the axles.

Another obvious advantage of the semi-trailer system is the gain in time when large or continuous shipments are being handled. While the first trailer is in transit, another is being loaded. Arriving at the destination, the tractor does not have to wait to be unloaded; he drops the loaded semi-trailer, hooks on to an empty one and hastens back to the loading point where another semi-trailer is already loaded and ready to be moved.

Interest in the money-saving features of the tractor-trailer system is of course not limited to the hauler alone; the customer is benefited as well, just as are the customer's customers to whom transportation savings can be relayed in lower retail prices of merchandise.

Truck transportation, especially that combined with

Lift *without* Labor



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Dept. FO-12 Milwaukee

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semi-trailer service, has done wonders for the rural community. Before the advent of the truck, rural freight service was cumbersome, slow, irregular, expensive and often irritating. Today it is almost as efficient, regular and economical as service in densely populated urban centers.

The semi-trailer, by increasing payload capacity without demanding greater power or the sacrifice of speed, and by the flexibility with which it adapts itself to practically any transport condition, fulfills an important function, which is bound to widen as the manifold advantages of the system become more widely understood.

●

"Not Necessary to Insulate These"

HERE'S a fleet of vans operated for the Kroger Grocery & Baking Company by the Star Transfer Line, Grand Rapids, Mich.

It is interesting to note that this operator reports the fact that in handling perishable merchandise during the winter months, it was not necessary to insulate the bodies, the panels of which are made of Plymetl. (There's one for our "You-May-Not-Believe-It" department.—ED.).

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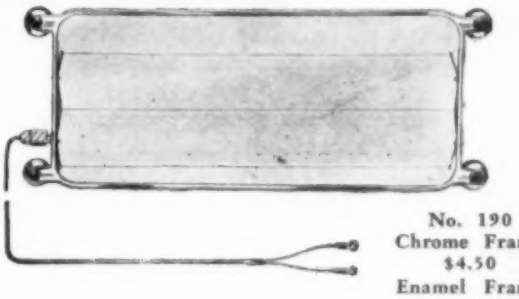

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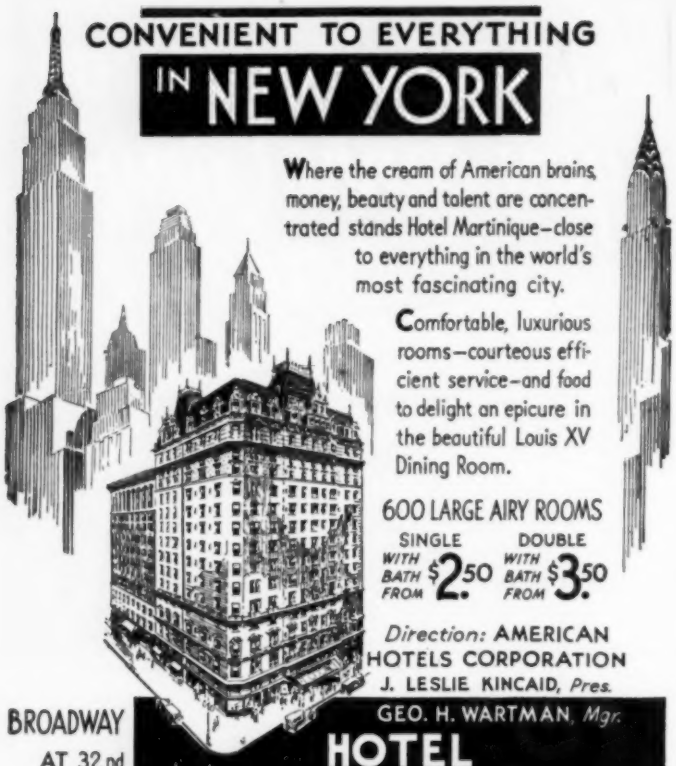

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Each Fleet needs an Executive who can analyze the complicated problems of Cost Accounting, Taxation, Personnel and Sales Cooperation. He must be familiar with the latest practice in Maintenance and Operation and the modern high components of today's Transportation requirements.

Such a man is now available and would like to have the opportunity of discussing this problem with you. Strict confidence will be appreciated and respected. Address Box 815, c/o Editor, FLEET OWNER, 90 West Street, New York, N. Y.

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Write for illustrated folder

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A ROOM and A BATH For TWO and A HALF

$2.50 SINGLE WITH BATH $4.00 DOUBLE WITH BATH

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39th AND CHESTNUT STS., PHILADELPHIA

Economy in Winter Purchase of Tires?

IN the interest of both safety and economy, the fleet owner should immediately check the condition of his tires and replace those worn dangerously smooth with new ones. This advice is offered by a leading rubber company after a careful compilation of figures revealing the following facts: First, that winter is the most hazardous season for driving; Second, that tire wear is less in winter than in any other season; Third, that tire prices today are lower than they will be in the near future.

Basing their study on the years 1931 and 1932, the company's statisticians established that the rate of accidents in relation to the amount of driving done was highest in November, December and January, as is shown in the following table:

	per cent		per cent
January	9.6	July	8.0
February	7.9	August	7.8
March	7.2	September	8.7
April	7.8	October	9.0
May	7.8	November	9.8
June	6.6	December	9.8

Incompleteness of most accident reports renders it difficult to determine just what part rain, ice and snow played in the increase registered in November, December and January, but it is known from records of the National Safety Council that weather conditions were contributing causes in 15 per cent of automobile deaths last year. These same records show further that one out of every 16 fatal accidents reported were due to skidding.

A smooth tire is apt to skid on any kind of road. On a surface slippery with rain or glazed with ice the smooth tire is a grave danger. As evidence, a car equipped with smooth tires, if running 30 miles an hour on wet asphalt, requires 76 feet to come to a stop. In contrast, a car equipped with tires with sharp treads, operating under the same conditions, comes to a stop in 51 feet. The difference of 24 feet may mean the difference between life and death.

The only tire which offers security in winter is one whose tread provides good traction. If it is necessary to buy new tires to get this traction, the operator will find that now is the most economical time to make his purchase.

Tire engineers have proved that tires can be bought in the fall, run all winter, and still be almost as good as new in the spring. They base their proof on the fact that tread wear is much less in cold weather. With 70 degrees representing the temperature at which normal tread wear occurs, the following table shows how mileage increases as the temperature declines:

Temperature	Mileage Increase
70	
60	25%
50	60%
40	100%
30	150%

From the table it may be seen that the operator who drives 30 miles an hour in 30 degrees of temperature will get one and a half times as much safe mileage as he would driving at the same rate in 70 degrees of temperature.

Similar results are obtained when varying rates of speeds are used.

The NEW SPOKE *CELORON TIMING GEAR*

IMMEDIATELY AVAILABLE

From NAPA WAREHOUSES AND DISTRIBUTORS

KRAMER Certified cooling RADIATORS

for TRUCKS BUSSES and TRACTORS

OVALTUBE TUBULAR and TURBO CELLULAR CORES

Complete Radiators

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Different As Day and Night—

"Extra Quality" features make the difference between WOHLERT parts and ordinary parts. You'll see for yourself when you try them. Water Pumps, King Pins, Starter Gears, Chrome-Nickel Cylinder Heads and other fast moving parts. Ask your jobber today.

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MAKE	MODEL	YEAR	KIND OF AXLE

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ADDRESS ..... PLACE .....

Note: New Low Prices as of Nov. 1, 1933.

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For the Oil, Gasoline, and Water Connections

You Can Rely On VELLUMOID

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Why take chances when you can have the best? It is identified by the name, Vellumoid, stamped on every foot of sheet packing.

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Keep on hand a supply of Vellumoid ready-cut gaskets for the cars, trucks, and busses in your fleet and sheet Vellumoid from which you can quickly cut or tap out any gaskets needed.

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REPLACEMENT GASKET MATERIAL

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United-American Bosch Corp.	15
U. S. Axle Co.	40
U. S. Equipment Corp.	—
United States Plywood Co.	44
Utility Trailer Mfg. Co.	46
Van Norman Machine Tool Co.	42
Vellumoid Co.	50
White Company	18 & 19
Wilkening Mfg. Co.	5
Wisconsin Axle Co.	—
Wohlert Corp.	49

QUICK, QUIET INSTALLATIONS

Double Diamond

MATED and LAPPED DRIVE AND PINION GEAR SETS

Quick, accurate installations and long, trouble-free service are imperative in drive and pinion gears if you are to effect maximum economies in maintenance and operating expense. In Double Diamond Gears, *you get both!*

Double Diamond Gear Sets are built to finest original equipment standards . . . which means perfect mating and lapping—not less than 3½% nickel steel in both drive gear and pinion (5% in bus and truck pinions)—upset forgings—copper-plated blanks.

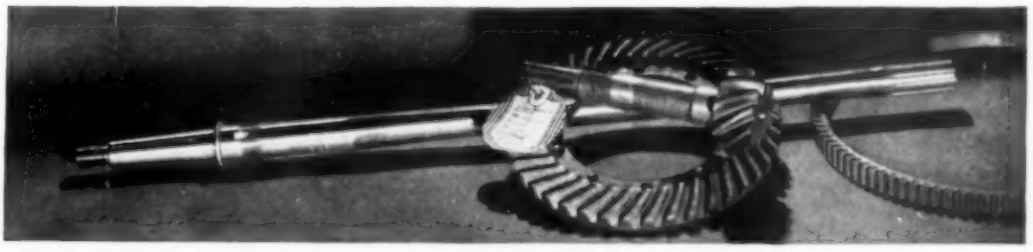
Only by using drive and pinion gears conforming to these specifications can you be assured of satisfactory installations and service.

Accuracy of installations, without loss of time in adjustment is further insured in Double Diamond Gear Sets by the mating tag wired to each set on which is marked the proper setting for the pinion, as determined on Gleason Testing Machines.

Double Diamond Mated and Lapped Gear Sets are distributed through a nation-wide warehouse system assisting more than 800 jobbers to give you prompt and complete service. Insure against breakdowns in service by asking for Double Diamonds by name.

AUTOMOTIVE GEAR WORKS, *Inc.*, RICHMOND, INDIANA

Manufacturers also of Double Diamond Chrome Nickel Steel Axle Shafts and Double Diamond Hardened Steel Flywheel Gears



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STEP UP COMPRESSION
BOOST OIL MILEAGE
in FORD
MODELS
A - AA - B

4 RINGS
2 COMPRESSION
1 SCRAPER COMPRESSION
1 GENUINE SUPER-
DRAINOIL OF
LATEST DESIGN

Install SEALED POWER HEAVY DUTY *Complete Units*

PISTON RINGS, PISTONS, PINS

These are specially constructed pistons with two ribs across head tying in to wrist pin bosses, having flange at lower edge of skirt to prevent distortion and collapse. They have 1/4" extra length, just right to clear the counter balances for easy installation in the new Model B. A longer piston cannot be used. These pistons are pin fitted and have four ring grooves carrying two regular SEALED POWER Compression rings, one scraper Compression ring and one genuine Super-DRAINOIL of latest design. A co-ordinated tailor made job which assures the fleet operator economical and satisfactory service over a long period.

The Complete Unit Package

You will appreciate the convenience of this assembly, factory fitted, ready to install, with a single source of responsibility. You will experience smoother and more powerful performance and the far greater economy that comes from parts designed and engineered to work together.

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MUSKEGON, MICHIGAN

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